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M. V. FULLER
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In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

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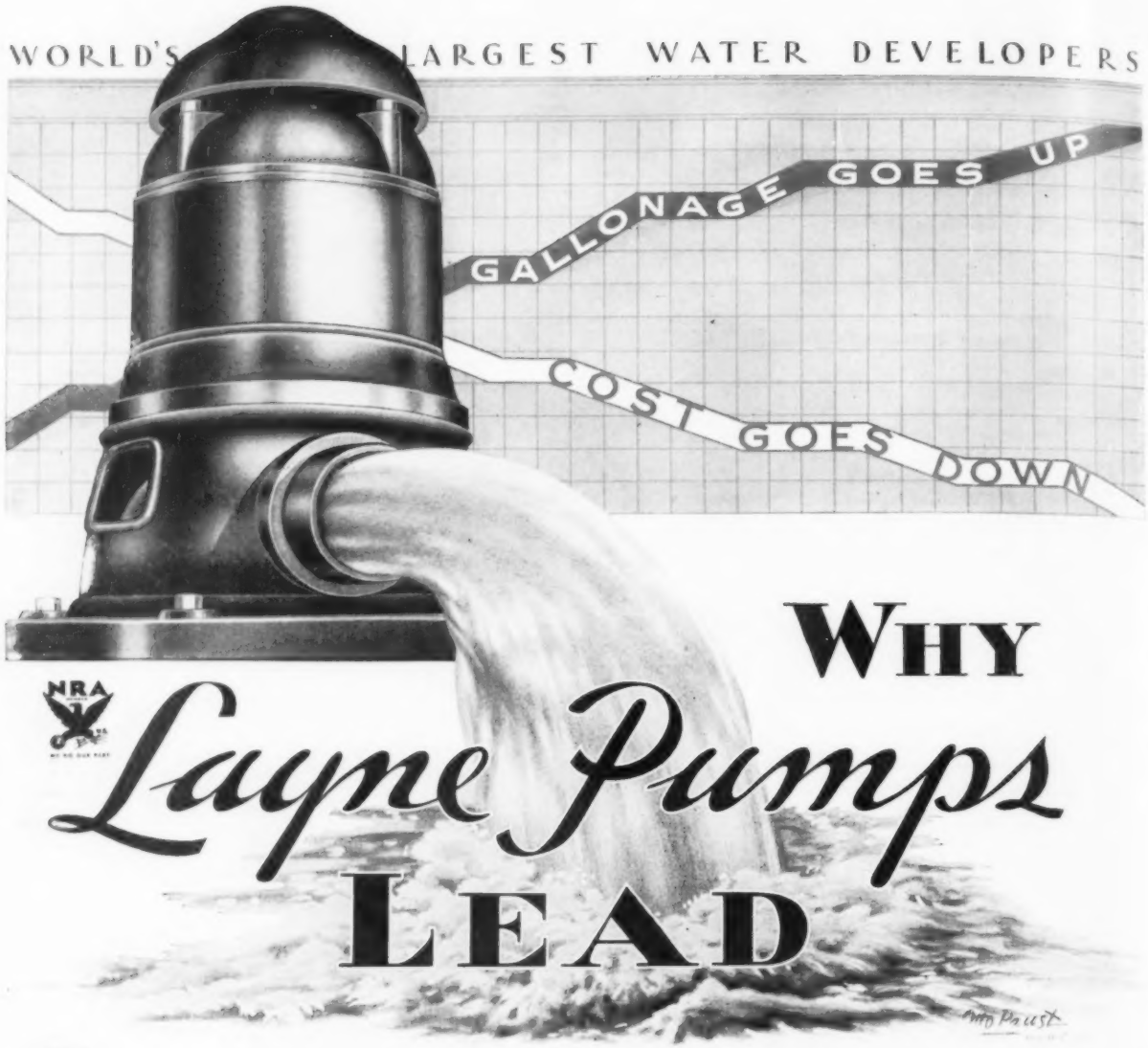

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Public Works—Public Indebtedness

Sewage Disposal Plants and School and Hospital Buildings Urged as Federal Projects

A PROPOSAL which is being advocated in Washington as this issue of THE AMERICAN CITY goes to press, is the inclusion in the 1934 public works bill of substantial appropriations by Congress for full Federal financing of the construction of sewage disposal plants and of school and hospital buildings. Advocates of this policy point out the urgent need of getting a really vast program of construction under way during the coming spring and summer months. Although the $3,300,000,000 PWA fund appropriated last year has been mostly allotted, the actual placing of contracts for local public works under the complications of the combined loan and grant provisions of the 1933 Act has been disappointingly slow. Bond purchase contracts and grant agreements covering 1,007 non-Federal allotments of loans and grants for construction of non-Federal projects had been sent out up to January 25, 1934, by the Public Works Administration to states, counties, cities, towns and other public agencies and private corporations; but the total Federal payments involved in these allotments was only $375,000,000.

It is believed that the three types of public works now suggested for special stimulus could be built with 100 per cent grants of Federal funds with the maximum of public benefit and minimum interference with local initiative.

Progress on PWA Highways to January 20, 1934

PROGRESS made on emergency construction of public works highways to January 20 under the supervision of the U. S. Bureau of Public Roads shows that a total of 5,614 projects, estimated to cost $289,958,000, had been advertised for contract or begun by day labor employed directly by the highway authorities. The cost of the day labor projects included in the above is estimated at $20,651,000.

Of the 4,852 projects awarded for construction, 3,140 were under construction on January 20, and 544 were completed. The work under construction, which is estimated to cost $181,996,000, was giving regular employment to 133,169 men.

In the whole country, work advertised for contract or started by day labor employed directly by the highway authorities involved 67.6 per cent of the $400,000,000 provided for public works highways under Section 204 of the National Industrial Recovery Act.

Accounting Controls for CWA and PWA Expenditures

NEW accounting controls now being installed by CWA and PWA are expected to serve as an effective check on graft or the appearance of graft. This statement is made by Donald C. Stone, Research Director of Public Administration Service, who, as a consulting accountant of these two Federal agencies, has directed the preparation of manuals of procedure. The CWA manual is already in use in all state and local CWA's in the country. The Public Works manual will be issued in February.

"These manuals are designed mainly to assist the Federal Government in controlling the expenditure of public funds and in checking on projects constructed," Mr. Stone explains. "At the same time, the manuals are of direct assistance to cities, counties and states in informing them of the most advanced methods of purchasing, cost accounting, disbursement of funds and planning of projects."

Introduction of these modern simplified and standardized accounting methods by the Federal Government will affect all the municipalities in the United States and is seen as a monumental step in the development of efficient public works accounting by local governments. Many of the procedures in the CWA and PWA manuals, it is pointed out, are applicable to regular city services and should therefore be of great assistance in making governments more efficient in the future.

"In examining CWA projects over the country," Mr. Stone says, "we have found that having the standardized manual has cleared up many local CWA difficulties by giving a definite plan of action."

Governmental Indebtedness—National, State and Local

THE total net debt of all governmental units amounted to $36,822,064,000 in 1932, according to figures just released by the Bureau of the Census. The Federal Government was responsible for $19,225,532,000, or over half this amount. Cities, towns, villages and boroughs came next, with a total of more than 8 billion dollars. States, counties and school districts were each responsible for over 2 billion and other civil divisions for almost 2 billion.

As is to be expected, the increase is the most rapid in the case of the Federal Government, which has been undertaking heroic measures to relieve distress and promote recovery. It is interesting to notice that the relative increase of indebtedness has been much greater for school districts and other civil divisions than for states and counties, and has increased less in proportion in cities, towns and villages than in any of the other governmental units.

Division of Government	Number of Governmental Units	Net Debt, 1932		Percentage Increase from 1912 or 1913‡ to 1932*
		Total	Per Capita	
Federal Government	1	$19,225,532,000	$154.41	1,769.2
States	48	2,373,934,000	19.17	583.1
Counties	3,052	2,293,932,000	20.85	514.7
Cities, towns, villages and boroughs	16,990	8,930,240,000	109.06	208.2
School districts	128,661	2,038,171,000	*	1,636.5
Townships	19,769	344,140,000	*	
Other civil divisions	26,430	1,719,476,000	*	
Total	194,631	$36,822,064,000	$295.73	659.1%

*Not computed. ‡ 1913 in the case of the Federal Government; otherwise 1912.

Speeding Up Non-Federal Construction Projects

THE recent announcement of Public Works Administrator Harold L. Ickes that allotments made to states, counties, cities, and towns for non-Federal construction projects would be rescinded and the money allotted to other projects unless the recipients executed bond purchase contracts and grant agreements sent out to them, is having the desired effect.

Many of the 84 recipients of allotments to which bond contracts and grant agreements were sent prior to December 1 and which had not executed and returned them up to January 4, when Secretary Ickes made their names public and announced that he was writing them that if they did not act within 10 days their allotments would be canceled, have rushed the necessary action or advised the Public Works Administration that it would be taken without further delay.

Division of Economics and Statistics

CREATION of a Division of Economics and Statistics of the Public Works Administration, with Clyde Ray Chambers, of Missouri, a specialist in economic research, as Director, has been announced by Administrator Harold L. Ickes.

The Administrator issued an order directing the new division to coordinate the statistical work of PWA with that of other government agencies to furnish the National Planning Board with statistical information it may require, and to supply the Administrator and Deputy Administrator with statistical information and analyses.

New 4,000,000-Gallon ELEVATED Reservoir

saves $4 per million gallons at SHEBOYGAN

SHEBOYGAN, WIS., is a recent addition to the list of cities using large amounts of elevated storage in their waterworks systems. In this particular instance, the storage is provided in a 4,000,000-gal. steel reservoir, elevated 27 ft. above the ground.

Make Thorough Load Survey

Before making the installation, however, the local waterworks officials made a thorough survey of existing conditions. One phase of the survey was to study the extreme variations in the daily load. Actual pumpage figures for a hot day in August, 1931, were used for this purpose. These figures, which are plotted on the chart below, reveal that (1) the maximum peak is almost twice the daily average (2) the maximum pumpage rate is 5.7 times the minimum and (3) the maximum daily total pumpage is twice the average for the year.

The survey also brought out that the full plant capacity was being used to meet normal demands. In fact, it was possible to meet peak loads only by drawing on the clear well storage at the filter plant. At such times there was little or no reserve for fire fighting.

Located on Taylor Hill—Opposite Pumping Plant

After carefully considering different plans for increasing the capacity of the system, the officials decided to install sufficient elevated storage to allow the pumping plant to be operated at a uniform rate during periods of large demand. This method was found to be most economical from both installation and operation standpoints.

General view of 4,000,000-gal. steel reservoir on concrete base at Sheboygan, Wis.

The size of the tank was determined by taking 30 per cent of the maximum daily pumpage or 4,000,000 gals. From past experience, it was found desirable to have this storage all in a range of 20 ft. In order to do this, the reservoir was made 185 ft. in diameter.

It is located on Taylor Hill, opposite the city from the pumping plant. During peak load periods, water feeds into the distribution system from both sides. This is highly desirable, as areas farthest from the pumping station often suffer from lack of pressure.

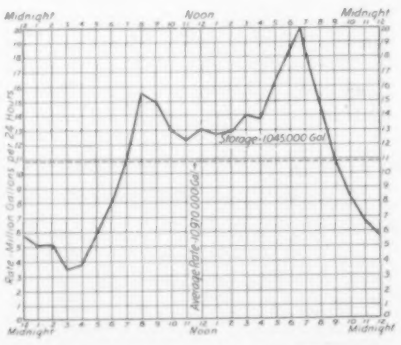

Chart showing actual pumpage figures in Sheboygan waterworks system for hot day in Aug., 1931.

Operating Benefits

Estimated savings due to improved pumping and filter plant efficiencies, uniform boiler loads, etc., are $4.00 per million gals. pumped. This is almost enough to pay the interest charges on the entire project.

With the reservoir in service, the various pumps are operated only as required, and then at full capacity. The pumping and filter plants are shut down entirely from 8 to 12 hrs. per day during the low pressure period. Pressure conditions throughout the system are improved. There is an adequate reserve under pressure at all times for fire protection. Forced shut-downs no longer interrupt service.

Write for Complete Description

The January, 1934, issue of THE WATER TOWER contains a more detailed description of this installation. Copies will be sent without cost on request.

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Water Meters Check Revenue Losses

Laurel, Md.

THERE is only one industrial service in Laurel, and that is metered. None of the domestic services are metered. The population of Laurel in 1924, 1930 and 1932 has remained constant at 2,500, and the average daily consumption per capita has increased successively from 70 to 80 to 88 to 93 gallons daily.—A. L. Gosnell, Superintendent.

Ann Arbor, Mich.

THE water system for the city of Ann Arbor started in 1883 under private ownership with a spring water supply. Water was furnished to the consumer on a flat-rate basis and with a very strict restriction as to use. Sprinkling was allowed only during limited hours under penalty of having the water turned off, and a charge was made to turn it on again. This kept the per capita consumption down to a very low figure, but the records are not complete and the actual information is not available. In the years preceding 1915, when the city purchased the old water company, a great deal of unfiltered river water was used. This was very unsatisfactory, and naturally its use was limited. In 1918 a new source of artesian water was located, and in 1919 and 1920 the system was fully metered. The per capita consumption was small at first owing to a fear on the part of consumers as to what their bills would be under the new system of billing on a quantity consumption basis. The per capita consumption became larger after the meters had been installed for some time and people had learned that water was cheap. So, in conclusion, contrary to common experience but because of local circumstances, the water consumption per capita is larger with a 100 per cent metered system than it was when the company operated on a flat-rate basis. The population figures given include the students of the University of Michigan. In 1910 the population was 18,966, there were no meters, and the average daily consumption was 97 gallons per capita. In 1920, the population was 27,313, meters were being installed but rates not fully established, and the average daily consumption was 93 gallons per capita. In 1930, with the system 100 per cent metered and the population 35,955, the average daily consumption was 126 gallons per capita. In 1932, with a population of 36,000 and the system 100 per cent metered, the per capita consumption was 107 gallons daily.—H. H. Caswell, Manager, Water Department.

Lincoln, Nebr.

IN 1913 the population of Lincoln was 50,000, and at that time all of the services were metered, and this percentage has been maintained since then. The average daily consumption was 62 gallons per capita. In 1920 the population was 54,934 and the consumption 93 gallons per capita daily. In 1930 the population was 75,919 and the per capita consumption 108.86 gallons per capita daily. In 1931 the population was 84,411 and the per capita consumption 88.16 gallons. In 1932 the estimated population was 86,411 and the consumption was 77.05 gallons per capita.—Paul W. Doerr, Superintendent, Water Department.

Rochester, N. Y.

THE percentage of consumption accounted for by meters in Rochester is only 68. The installation of meters has, however, maintained a reasonable balance and has resulted in the last few years in a decrease in the per capita consumption. In 1900 the population was 162,608, the services were 28.5 per cent metered and the per capita consumption was 76.2. In 1910 the population was 218,149, the services were 97 per cent metered and the per capita consumption was 80.8 gallons daily. The population increased to 295,750 in 1920, when the maximum services metered reached 99. At this time the consumption was 95.7 gallons per capita daily. In 1930, with a population of 325,019 and the services 99 per cent metered, the consumption showed another increase to 99.8 gallons per capita daily, which was reduced to 89.8 in 1932, when the population was 329,000 and the services were still 99 per cent metered. The decrease in consumption per capita in 1932 is due to decreased consumption by industrial users and elimination of leaks in pipe lines.—A. P. Mussi, Assistant Engineer, Water Department.

Greenville, N. C.

ONE hundred per cent metering of the water services in Greenville has increased the revenue 15 per cent and decreased the pumpage 50 per cent. The population of Greenville is 10,000 and the average daily per capita consumption is 70 gallons.—M. Swartz, Superintendent, Water and Light Commission.

Monroe, N. C.

NO RECORDS are available in Monroe showing the actual consumption of water per capita before 100 per cent metering was put into effect. It is my personal feeling, however, that to furnish water without 100 per cent metering is very unfair, not only to the municipalities, but also to those consumers who are metered. The population of Monroe has varied from 4,080 to 6,500 from 1910 to 1932, and the services have been 100 per cent metered at all times. The per capita consumption has varied between 47 gallons and 62 gallons daily. —George W. Tucker, Superintendent, Water and Light Department.

Fargo, N. Dak.

THE water services of Fargo have been 100 per cent metered since 1920. In 1922 and in 1931 extensive pitometer surveys were made to locate leaks which were causing a considerable loss of water and running up the "unaccounted for" account. In the last four years there has been a severe drought in North Dakota, which has placed an extremely large irrigation load on the water works. In 1913, the first year for which records are available for the Fargo plant, the population was 17,000, there were no meters, and the consumption was 138.7 gallons per capita daily. In 1920, when 100 per cent metering began, the population was 22,700 and the consumption 98.4 gallons per capita daily. This was reduced to 94.1 gallons in 1930, when the population was 28,560, and still further reduced to 83.8 gallons per capita daily in 1932, when the population was 29,000.—W. P. Tarbell, City Engineer and Superintendent, Water Department.

Akron, Ohio

WERE the Akron water system unmetered today,—and it is 100 per cent metered,—an additional supply would be immediately necessary, at a cost of approximately $5,000,000. Not only has this investment been postponed to the future, but purification and pumping costs are lowered by at least one-third. The peak and average loads are relatively lower. The increased capital investment which would be required were the system not 100 per cent metered would mean higher water rates to keep the department self-supporting. In 1915 Akron had a population of 102,000. The services were 35 per cent metered and the consumption was 117.3 gallons per capita daily. In 1920, when the services were first 100 per cent metered, the population was 208,000 and the consumption 93.2 gallons per capita daily. This was reduced to 81.2 gallons daily in 1930, when the population had risen to 255,000 and still further to 78.4 gallons per capita daily in 1932, when the population was 245,000.—W. R. La Due, Acting Superintendent, Akron Water Works.

Bucyrus, Ohio

FROM 1914 to 1920 about 980 new services were installed in the water system with meters, and about 97 per cent of the old services were metered. The result was that in spite of the 980 new services the daily pumpage was decreased about 200,000 gallons. In 1930, when the population of Bucyrus was 10,000, the domestic services were 97 per cent metered and the industrial services 100 per cent metered, the average consumption was 110.5 gallons per capita daily. In 1931, with the same population and the same percentage of metered services, the consumption was reduced to 99 gallons per capita daily.—Roy Riley, Superintendent, Bucyrus Water Department.

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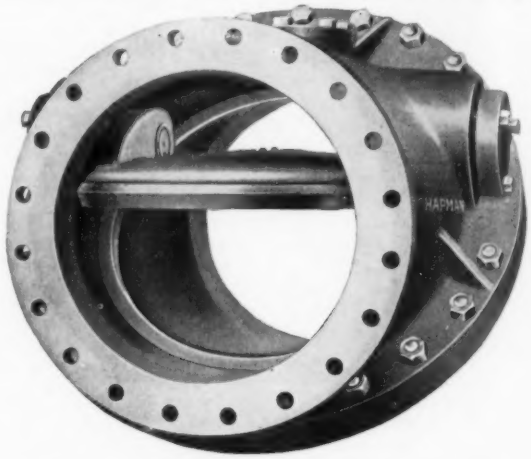

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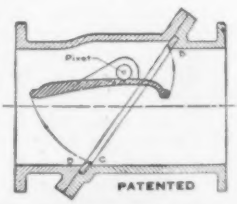

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Water Meters Check Revenue Losses

Cincinnati, Ohio

SINCE 1910 Cincinnati has shown a steady decrease in the per capita consumption with its increase in percentage of services metered. In 1900, when the population was 332,000, only 12.07 per cent of the services were metered and the daily consumption was 114.62 gallons per capita. In 1910, with the population risen to 360,000 and with 36.91 per cent of the services metered, the daily consumption had increased to 127.83 gallons per capita. From this point on, the daily consumption has decreased. In 1920 the population was 401,247, the services were 63.88 per cent metered and the consumption was 119.4 gallons per capita daily. In 1929 the population was 447,650, the services were 77.25 per cent metered and the consumption 111.74 gallons per capita daily. In 1932 the population had increased to 462,000, the services were 100 per cent metered and the consumption had been reduced to 102.5 gallons per capita daily. —A. H. HIBBS, Superintendent.

Columbus, Ohio

THE per capita consumption of Columbus has shown a slight variation both up and down since 1910. But since 1930, when the services have been better than 99 per cent metered, there has been more control over the system, the per capita daily consumption has been again reduced and there has been less expense for purifying, pumping and distribution facilities, effecting a considerable saving to the department. In 1900 only 32 per cent of the services were metered and the consumption was 194 gallons per capita daily. In 1910, with a population of 181,000, and the services 91.3 per cent metered, the consumption was 76 gallons per capita daily. In 1920, with a population of 237,000 and 98.0 per cent of the services metered, the consumption was 95 gallons per capita daily. In 1930 the population was 291,000, the services were 99.2 per cent metered, and the consumption was 108 gallons per capita daily. 1930 was the year of the record drought, which accounts for the increase in per capita consumption. The consumption of water is affected by metering, climatic conditions, and any enlargement of distributing facilities which provides a more ample supply to a part or the whole of the city. In 1932 the population was 301,000, the services were 99.3 per cent metered, and, the consumption was 101 gallons per capita daily.—C. B. HOOVER, Superintendent.

Conneaut, Ohio

A REDUCTION in per capita consumption from 359 gallons daily to 23 gallons daily is the record which Conneaut has established through universal metering. In 1900, when the population was only 3,320, the domestic services were 20 per cent metered and there were no meters on the industrial services. It was then that the average daily consumption per capita was 359 gallons. In 1910 the population had increased to 6,328, the domestic services were 49 per cent metered and the industrial services were 90 per cent metered. The consumption had dropped to 80 gallons per capita daily. It was about 1907 that metering was started, and in 1923 universal metering was adopted. In 1900 there were only 850 consumers and the pumpage was 1,000,000 gallons per day, while in 1931, with 2,800 consumers, the pumpage was only 1,300,000 gallons daily. The record by decades after 1910 showed the population as 9,240 in 1920, with the domestic services 68 per cent metered, the industrial 100 per cent metered and the per capita consumption 22 gallons daily. The population had increased to 10,528 in 1930, the domestic services were 99.5 per cent metered and the industrial services were 100 per cent metered. There was a slight increase to 26 gallons per capita daily consumption. In 1931 the population had dropped slightly, to 10,336, the domestic services were 99.7 per cent metered, the industrial services were 100 per cent metered and the consumption was 23 gallons per capita daily.—LEE HARVEY, Superintendent.

Dyersburg, Tenn.

THE installation of meters on the domestic and industrial services in Dyersburg have produced an estimated saving of $10,000 per year in the operation of the water works. In 1910, when the population was 4,149, the domestic services 20 per cent and the industrial services 5 per cent metered, the average daily consumption was 156 gallons per capita. In 1920, with a population of 6,444 and 75 per cent of the domestic services and 10 per cent of the industrial services metered, the per capita consumption was 85 gallons per capita. In 1930 the population had increased to 8,733, the domestic services were 90 per cent metered, the industrial services were 10 per cent metered and the consumption was 57 gallons per capita daily. These same figures applied for 1932.—S. R. BLAKEMAN, Superintendent. Water Department.

San Antonio, Texas

IN 1920 only 42 per cent of the services in San Antonio were metered, the average daily consumption was 126 gallons per capita, and the population served was 161,000. The population served had increased to 254,592 in 1930, when universal metering was in force, and the consumption had dropped to 87 gallons per capita daily. In 1931 the population was 260,000, the services were still 100 per cent metered and the consumption was 86.8 gallons per capita. This dropped to 80 in 1932, with the same population.—W. D. MASTERSON, Manager, Water Department.

Tacoma, Wash.

THE metering of services in Tacoma began shortly prior to 1920. In 1920, when the population was 97,646, 8.9 per cent of the services were metered and the average daily consumption was 251 gallons per capita daily. In 1930, with only 26.2 per cent of the services metered and a population of 106,600, the consumption was 240 gallons per capita daily. In 1932, with a population of 106,800 and only 26.7 per cent of the services metered, the consumption was still 240 gallons per capita daily.—W. A. KUNIGK, Superintendent, Water Division.

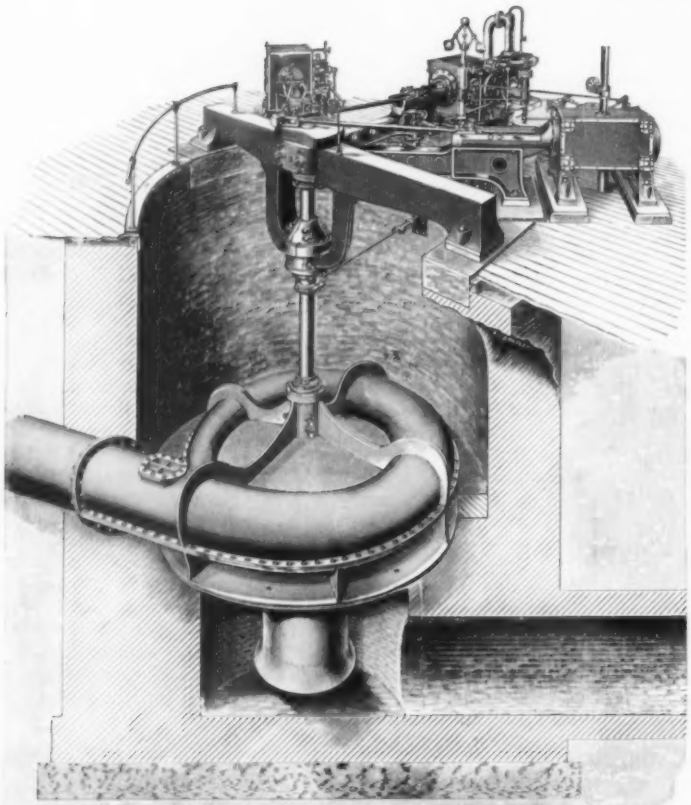
Fond du Lac, Wis.

IN 1912 the population of Fond du Lac was 19,000, 63 per cent of the domestic services and 85 per cent of the industrial services were metered and the average daily consumption was 96 gallons per capita. With a moderate increase in the services metered to 78 per cent domestic and 94 per cent industrial and a population of 23,400, the consumption was reduced to 63 gallons per capita daily. In 1930, however, this had increased slightly, to 70 gallons per capita daily, in spite of 97.7 per cent domestic and 100 per cent industrial services metered and a population of 26,400. In 1932, with the same population and 98 per cent of the domestic services and 100 per cent of the industrial services metered, the consumption was 57 gallons per capita daily—EDW. J. BRAUN, Superintendent.

Waukesha, Wis.

SINCE 1930 the water meters in Waukesha have been very carefully checked and all worn-out meters have been junked. The metered sales during the last years have not dropped much, although the pumpage has been reduced, showing that we are measuring the water more accurately at the user's end of the distribution system. Approximately 250 new meters were purchased last year and extra men were placed in crews to repair all worn meters. About $4,500 was spent last year in repair parts, and it is felt that all of the money spent by the city for these parts and the labor for placing them in the meters is coming back within a very short time through increased revenue. In 1920 the population of Waukesha was 12,558, all services were metered and the daily consumption was 120 gallons per capita. In 1930, with the population at 16,700 and universal metering continued, the consumption remained at the same figure. It was reduced, however, in 1932 to 81 gallons per capita daily, with universal metering and the population 17,000.—A. P. KURANZ, Superintendent.

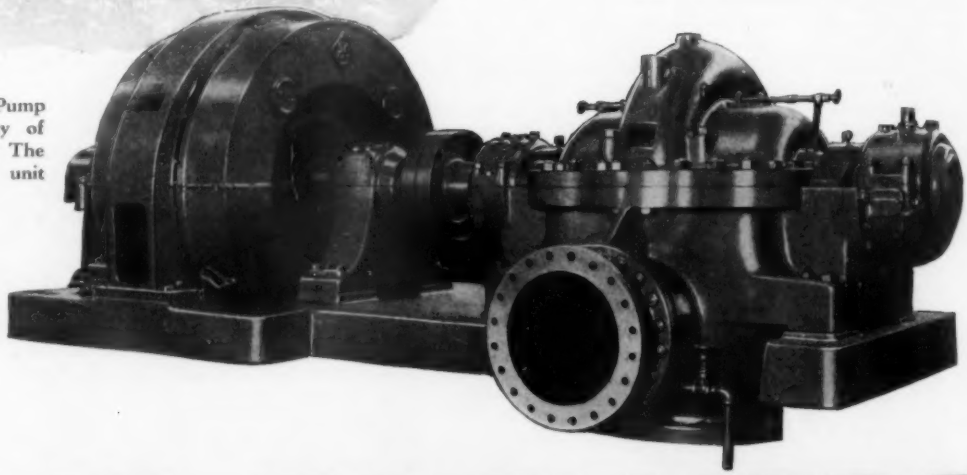
1884-1934—Fifty Years furnishing Centrifugal Pumps for Municipal Service



THIS experience, together with modern designs is available and valuable to all cities large or small contemplating water works and sewage handling projects. These projects with Federal aid are being very generally considered at the present time and in this connection it is important to get modern and efficient pumping equipment such as Allis-Chalmers can furnish out of their long experience in serving the water works field. Leaflet 2150 which will be sent on request tells what can be reasonably expected in performance with modern Allis-Chalmers centrifugal pumps.

Synchronous Motor Driven Centrifugal Pump for peak load pumping from ground storage tank furnished the City of Milwaukee 1934.

A 48" x 72" Sewage Pump was furnished the City of Milwaukee in 1884. The above "Boston Type" unit was built in 1893.



ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

Highways—Drainage—Snow Removal

COST AND QUANTITIES—ROAD OILING, 1916-1932, IN TORONTO

Year	Mileage	Area Oiled	Gals. Used	Total Cost Oil and Labor	Cost per Mile	Cost per 1,000 Sq. Yds.
1916	181.6	2,863,359	280,667	$22,772.69	$125.39	$7.59
1917	180.9	2,761,761	244,832	27,103.36	149.28	9.78
1918	108.2	1,743,612	172,997	22,057.33	203.84	12.65
1919	228.0	2,943,071	354,165	27,501.36	120.66	9.34
1920	201.6	3,353,660	253,716	46,886.65	232.13	19.49
1921	173.8	2,150,844	253,434	22,651.32	130.27	10.54
1922	244.2	3,147,237	361,945	33,468.56	149.28	10.11
1923	188.7	2,342,324	338,850	32,119.17	170.20	13.82
1924	164.0	1,886,838	295,300	28,004.56	170.34	14.84
1925	142.6	1,606,652	264,020	25,427.70	178.32	15.83
1926	136.9	1,613,569	244,673	23,639.97	171.81	14.65
1927	135.7	1,527,079	267,278	24,207.45	178.39	15.83
1928	139.1	1,578,409	294,130	21,322.12	153.29	13.51
1929	197.0	1,674,054	310,899	19,909.82	101.07	11.89
1930	73.1	758,320	143,320	9,890.81	135.30	13.09
1931	52.1	624,199	120,448	8,176.70	156.94	13.10
1932	27.9	362,000	57,825	3,946.53	141.45	10.87

Road Oiling in Toronto

THE road oiling service in Toronto, Ont., during the past ten years has shown a marked decrease, owing to the construction of improved roadways. The maximum distribution of oil was made in 1922, when 362,000 gallons of oil were used, covering 244 miles of streets, the applications varying from one to three times per season. This distribution was reduced to 57,825 gallons in 1932, covering 28 miles of streets, while unimproved street mileage decreased from 142 to 33 miles in the same period. Owing to the surface which has been developed on these roadways, it is only necessary to apply oil once during the season.

GEORGE W. DIES,
Street Commissioner.

Street Paving and Maintenance

THE total length of public streets within the corporate limits of the village of Oak Park, Ill., is 107.86 miles. The mileage of paving is as follows: asphaltic concrete, 37.15 miles; sheet asphalt, 35.42 miles; macadam, 20.12 miles; brick, 13.41 miles; and concrete, 1.65 miles, making a total of 107.75 miles of pavement.

The work of the Street Department covers the maintenance of all public improvements such as street and alley pavements, sewers, sidewalks, the cleaning of street and alley pavements, installation and maintenance of traffic signals, street signs and markings, removal of household waste and garbage, care of parkways, maintenance of miscellaneous work in connection with public improvements and the use of property.

The equipment of this Department includes twenty horses, two dump wagons, one steel riding snow-plow, three straight-blade street snow-plows, one V-shaped street snow-plow, twenty steel sidewalk snow-plows, one sewer-cleaning machine, two mowing machines, one paint-spraying machine, three 1-ton Ford dump body trucks, one Ford coupé, one 2-ton G.M.C. truck, two 5-ton Sterling trucks, one 1-ton Ford truck, one 1-ton White truck, two 5-ton Mack tractor trucks, 16 Highway trailers, one 10-ton Austin-Western road roller, one Austin-Western street sweeper, one Elgin Auto Eductor on a 5-ton Diamond T Chassis, one 1-ton Ford tractor, and three semi-trailers.

The cost of street maintenance in 1931 and 1932 is shown in the following table:

W. L. BERRY,
Assistant Superintendent of Streets, Oak Park, Ill.

A Creosoted Wood Conduit for Airport Drainage

IN the recently completed municipal airport at Des Moines, Iowa, more than 4,000 lineal feet of pressure-creosoted wood conduit were installed for the larger sizes required in the storm drainage system. A contour map showed that the highest point of the field was near the center and that natural surface drainage was provided in all directions. To take advantage of this, the runways were designed without any crown. A cross slope was provided to insure run-off from the impervious area to one side of the runway only. At no point did the gradient across the runway exceed 0.6 per cent. This required the construction of but one drainage line in place of the usual two required where crowned runways are used. The drains not only serve the runways but also the run-off from a considerable area near the runways. The increased area served by one drain necessitated the use of a larger conduit than if two were provided.

After investigation it was decided to use square creosoted wood conduit for the sizes of 15 inches and larger, and perforated metal pipe for the smaller openings. To insure quick admittance of the water from the gravel and crushed stone backfill, the bottom half of the sides of the wood conduit was slotted with openings tapering from 3/16-inch on the outside to 5/16-inch on the inside. It was believed that this method of tapered slotting would prevent any tendency for the seepage openings to clog with material that might pass the outside 3/16-inch aperture, and that the large area of intake opening obtained in this design would afford a satisfactory means of quick removal of water from the field. The conduit is built of laminated southern yellow pine pressure-treated with coal-tar creosote by an empty-cell process.

A. E. THOMAS,
Airport Superintendent.

Snow Removal in Oak Park, Ill.

WHENEVER weather conditions make it necessary, snow is removed from the sidewalks and street pavements in Oak Park, Ill. The 200 miles of sidewalks are plowed with steel V-shaped horse-drawn plows. The horses from the Garbage and Rubbish Collection Department are used for plowing the sidewalks. The teams are started out early in the morning and, as a rule, all sidewalks are plowed by noon. Sidewalks leading to transportation stations and to schools are plowed first. All street pavements in the village are plowed. Boulevards, through streets and business districts are plowed first; that is, the snow is pushed from the pavement to the curbing. After the principal thoroughfares are plowed, the residential streets are plowed.

Snow from the business districts, the principal intersections and from around public schools, churches, etc., is removed by truck and disposed of in vacant lots around the village. In February, March and December, 1932, there was considerable snow. The 200 miles of sidewalks in the village were plowed three times. Boulevards and through streets, of which there are 11.5 miles, and all other streets, of which there are 100 miles, were plowed three times. The total cost of snow removal was as follows:

Labor	$3,492.23
Superintendence	192.50
Teams	122.50
Trucks	274.55
Hired teams and trucks	316.50
Repairs to equipment	25.31
Supplies	188.17
Miscellaneous	29.00
New equipment—snow-plow	455.00
	$5,095.76

1,176 loads of snow removed.
15,400 pounds of salt used.
11 cubic yards of cinders used.
6 cubic yards of sand used.

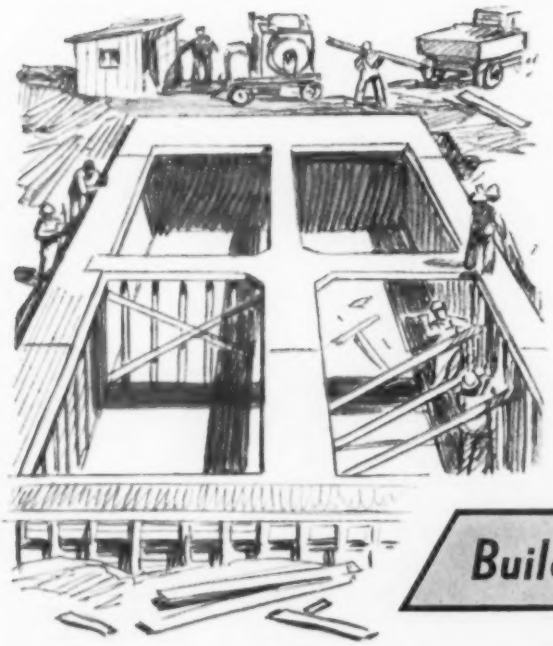
DUDLEY C. MEYERS,
Commissioner of Public Works, Oak Park, Ill.

STREET MAINTENANCE—1931-1932 IN OAK PARK, ILL.

Kind of Pavement	Miles of Each Kind of Pavement in Village	1932 Square Yards Repaired	1932 Total Cost	1932 Cost per Square Yard	1931 Square Yards Repaired	1931 Total Cost	1931 Cost per Square Yard
Asphaltic concrete	37.15	9,157	$4,946.86	.540	10,649	$6,625.29	.622
Sheet Aspnalt	35.42	3,824	2,281.92	.597	11,456	6,263.89	.547
Macadam	20.12	4,817	1,955.01	.406	9,412	3,625.45	.385
Brick	13.41	2,092	1,209.78	.578	8,714	4,462.83	.512
Concrete	1.65	....	.....	....	.....	.....	....
Resurfacing	.....	.....	.....	....	22,106	3,011.69	.136
Total	107.75	19,890	$10,393.57	....	62,337	$23,989.15	

Now is the Time

to Interest the Public in its Health



● The public is notoriously careless of the public health. It has been the leaders who have forced the issue in the advance of sanitation.

Now, the Federal Government will aid in financing sewage disposal systems. Now, many states have passed, or are passing, enabling legislation to place sewage disposal plants on a self-liquidating and self-supporting basis. This applies both to construction and operating costs. Now, people expect to see men employed and money expended on public works.

Now is the time to interest the public in its health. Now is the time to clean up our lakes and streams. The Portland Cement Association has much information that will help you start sewage treatment plants in your community. Write today.

Build Sewage Disposal Plants NOW

PORTLAND CEMENT ASSOCIATION
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85% to 90% of the money spent on Concrete Construction goes to Labor!

Sewerage and Sewage Disposal

Treatment of Bar Screenings with Digestive Sludge

BAR screenings assume a position of relative unimportance when compared with the aggregate mass of solids retained and treated at a sewage plant that undertakes complete treatment. Specifically, they may amount to from ½ to 5 cubic feet per million gallons of flow, depending upon the rack openings and the time of concentration of the sewage at the plant. The average is about 2 cubic feet of material at 85 per cent moisture, with the dry solids content averaging 25 pounds per million gallons of 90 per cent non-putrescible material. Believing that bar screenings if washed of their putrescible material would dry without nuisance, the Los Angele County Sanitation District arranged and completed an interesting experiment. Two open pits were dug in tight clay soil. Each was about 12½ feet square by 10 feet deep, with the sides sloping slightly. They were simply unlined open pits and were left uncovered during the test. No equipment for heat control or for pumping was installed.

From the sludge digestion tanks for the main plant a quantity of sludge which had about completed digestion was pumped into each pit. Forty per cent of pit No. 1 was filled, and 60 per cent of pit No. 2. The digested sludge contained 96 per cent moisture, and the dry material contained 48 per cent volatile matter. The pits were then filled to capacity with tank skimmings and bar screenings at the rate of 25 cubic feet of bar screenings and 80 cubic feet of tank skimmings a day, divided equally between the pits. This operation required 12 to 15 days. At the expiration of the time consumed in filling to capacity, pit No. 1, with 40 per cent seed, had turned acid, had almost entirely ceased gassing, and gave off a sour pig-pen odor. It was blanketed with a dry, thick skum, difficult to break up, and had the general appearance and odor of acid fermentation. On the contrary, pit No. 2, with 60 per cent seed, although covered with a similar scum, was digesting nicely, giving off the characteristic odors of fair digestion, and although it dropped to a pH of 6.6 to 6.8 for a short time, recovered to 7.0 or about and maintained itself there till placed on drying beds. Pit No. 1 dropped to 6.0. The temperature in both pits averaged 65 degrees Fahrenheit throughout the experiments.

Pit No. 1 receives a daily addition of 20 to 25 cubic feet of bar screenings, and its condition is steadily improving. It gives increasing evidence of the ability of a digesting mass of sludge to do the job of destroying the putrefactive material caught up with bar screenings. Already there is fair evidence that as this putrefying material is "washed out" the remainder can be dried without nuisance, even though much of it still retains its identity. As a secondary issue, the material from such digestion is worth $2.00 per dry ton delivered onto sand beds. Assuming that 15 per cent of the bar screenings is destroyed in the digestion process, there remains a gross return of about $7.50 per year for each million gallons daily of sewage treated, significant only in the fact that, capitalized, it will provide for an investment of $112.50 per million gallons daily flow for handling bar screenings in this manner, an amount about sufficient to erect such simple tanks as are required for this purpose. Burning or burying would increase the cost of handling without a return on the investment.

—From a paper by A. M. Rawn, Assistant Chief Engineer, Los Angeles County Sanitarium District, Los Angeles, Calif., presented before the Fourth Spring Conference of the California Sewage Works Association.

The Thermophilic Digestion of Sewage Sludge

THERMOPHILIC digestion, or digestion speeded by thermophilic or heat-loving bacteria, is applicable to all types of undigested sewage sludge, notably raw sludge resulting from plain subsidence, and activated sludge. The process is conducted in closed tanks, which in current practice and in the absence of specific anaerobic thermogens must be heated to somewhere between 120 degrees and 140 degrees Fahrenheit. Thermophilic digestion is still in the experimental stage. It has been demonstrated to accomplish in a few days the same results that are achieved in much longer periods by digestion with other and more usual types of anaerobes at lower temperatures.

In the process of digestion of sewage sludge, approximately one-third of the original weight of solid matter is transformed into gases such as methane, carbon dioxide, hydrogen, ammonia, etc., one-third is converted into water and one-third remains as humus. As in other anaerobic processes of digestion, the best results are secured with alkaline conditions in the tanks, that is with pH values above 7.0. The humus resulting from the process, when dried, is stable and practically odorless and constitutes a valuable fertilizer.

There are many interesting analogies between the thermophilic digestion of municipal garbage as conducted in the Beccari cells and the thermophilic digestion of sewage sludge as developed by laboratory and field experimentation. One striking difference should be noted, however. The digestion of garbage is as yet only a batch process, while that of sludge is ordinarily a continuous procedure. It is simpler and cheaper to operate the former as a batch process and to operate the latter as a continuous process. Experience indicates that three or more cycles of operation are necessary with new Beccari cells before satisfactory digestion is established, unless seed material in the form of humus from a properly operating cell is introduced with the raw garbage. If such seeding is had, good results seem to be obtained at once. In exactly the same way it is necessary to develop satisfactory seed sludge in order to conduct thermophilic digestion of sewage sludge. It has been demonstrated not only that the type of seed sludge must be suitable but that the amount must be sufficient and must be related to the amount of raw sludge introduced into the digestion tank.

The humus resulting from sludge digestion has the following general composition based on dry weight in respect to the constituents named:

Nitrogen	2.1 per cent
Phosphates, as P_2O_5	1.4 per cent
Potassium, as K_2O	0.6 per cent

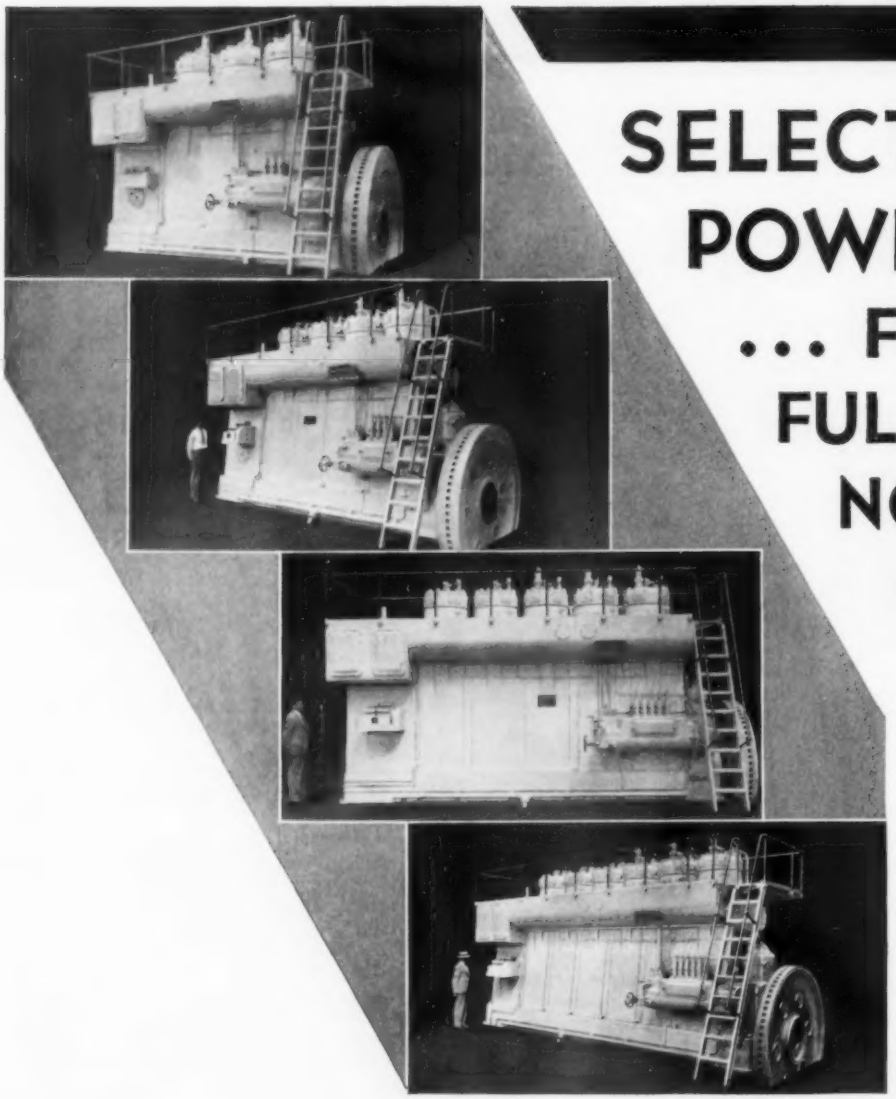
—From a paper presented by Charles Gilman Hyde, Professor of Sanitary Engineering, University of California, before the California Sewage Works Association.

Sewers and Sewage Works in New York State

THERE are in New York State some 363 sewer systems, serving a population of 10,528,000, or 83.5 per cent of the entire population of the state. One hundred and sixty-six municipalities provide for some degree of treatment of their sewage in a total of 190 sewage treatment plants, ranging from fine screening as the only treatment in some cases, to primary sedimentation, oxidation, secondary settling, sand filtration and chlorination as the treatment in a few instances. In addition, there are about 52 municipalities or districts served by plants owned by other cities, villages or districts. The total population served by municipal treatment plants is about 2,170,000, or 20.5 per cent of the population served by sewer systems.

Classification of the treatment plants as to type shows that there are 16 plants employing fine screens alone or in conjunction with chlorination, and 107 plants in which treatment consists of primary settling, with or without chlorination of the effluent. These plants may be divided into three groups, consisting of 44 plain sedimentation or septic tanks, 22 settling tanks with separate sludge digestion, and 50 Imhoff tanks. The remaining 67 plants consist of various combinations of primary and secondary treatment processes. There are still 11 municipal plants in the state where contact beds are employed. Trickling filter installations predominate as secondary treatment units, of which there are 34. Sand filters are used at 17 plants. Six of the latter installations consist of natural sand percolation beds and are located principally on Long Island, where soil conditions are favorable for such disposal.

—From a paper by Charles C. Agar, Assistant Sanitary Engineer, New York State Department of Health, presented before the seventh annual conference of the Pennsylvania Sewage Works Association.



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Refuse Removal and Destruction

CONVERTING THE OLD CITY DUMP IN WEST LAFAYETTE, IND., INTO A CITY PARK, WITH AN ALLIS-CHALMERS 35 TRACTOR AND A ROTARY SCRAPER

United States Supreme Court Orders New York City to Stop Dumping Garbage

NEW YORK CITY was ordered by the Supreme Court of the United States on December 4 to discontinue its practice of dumping garbage at sea by July 1, 1934, under penalty of paying the state of New Jersey $5,000 daily after that date if the practice is continued. The Court's action was taken in an opinion extending the period during which New York might construct incinerators for garbage disposal. New Jersey sought to have New York City held in contempt after a hearing during which the city pleaded its financial condition had made it impossible to comply with the Court's earlier decree. The Court also held that payment of the $5,000 stipulated after July 1, 1934, should not prevent New Jersey from taking any other remedial action available to it.

Two incinerators are under construction in Manhattan and The Bronx. Work on the other two has not been started. The former will be completed by the middle of 1934.

Refuse Disposal in Manchester, England

THE Manchester Cleansing Department was established many years ago and is one of the oldest in England. The refuse collected in 1933 was 13,000 tons less than during the previous year, in spite of the fact that 2,446 premises were added to the collection routes. This reduction was partly due to propaganda and partly to other causes, such as the increased use of gas and electrical methods of heating and cooking, and the greater use of canned foodstuffs. The principal cause of the decline is very probably bad times and the increased number of empty premises.

A new separation plant was placed in operation during the 1932-33 period covered by the report. The three plants now in operation in Manchester are capable of handling 340 tons in 8 hours. There are in use in Manchester 203,326 ashbins, which are supplied and maintained by the Corporation. Nearly 1,500 of these were supplied in the period covered by the report.

A number of years ago the city of Manchester instituted the Carrington and Chat Moss reclamation schemes, and in this time it has disposed of 3,083,730 tons of refuse on these peaty lands. Today there are 58 tenants occupying the land and paying to the Cleansing Committee amounts to about $35,000 per year.

—From an abstract published in *The Municipal Journal and Public Works Engineer*, of London, England.

The Effect of Business Conditions on Refuse Collection

DURING 1932 there was a reduction of 6 per cent, or 28,000 tons, in the total tonnage of ashes and garbage collected in Toronto, Ontario, when compared with the preceding year. The reduction in ashes and rubbish amounted to 24,000 tons, while the reduction in garbage amounted to 4,000 tons. This was due in general to the present economic situation, and to the use of coke and Welsh anthracite coal, which contains a much lesser ash residue than American anthracite. The unrestricted collector who has developed within the past two years has also contributed to this reduction in refuse. He usually works at night, prowling the streets with pushcart and bag, removing paper, rags, bottles and other salvable material, from receptacles which have been placed out for collection to be made on the following day. The growth of these collectors has been very rapid during the past year, and also the amount of light combustible material which is removed from the refuse is being reflected in the operation of the refuse disposal plant.

SUMMARY OF REFUSE COLLECTION SERVICE, TORONTO, ONT., 1917-1932

Year	Ashes (tonnage)	Garbage (tonnage)	Expenditure
1917.....	230,145	120,666	$348,595.00
1918.....	223,251	113,616	415,757.00
1919.....	233,004	118,189	455,973.00
1920.....	254,200	130,748	747,081.00
1921.....	227,043	131,459	708,056.00
1922.....	247,657	149,996	758,246.00
1923.....	260,706	156,985	831,307.00
1924.....	254,238	167,052	840,672.00
1925.....	257,093	143,059	835,588.00
1926.....	264,361	138,654	842,237.00
1927.....	250,846	140,643	838,723.00
1928.....	259,758	152,326	854,823.00
1929.....	252,216	159,153	891,690.00
1930.....	254,189	162,560	900,838.00
1931.....	302,592	171,604	921,736.00
1932.....	278,738	167,775	894,154.00

GEORGE W. DIES,
Street Commissioner.

AN ANALYSIS OF COSTS OF GARBAGE AND TRASH COLLECTION AND DISPOSAL AT MIAMI, FLA. PREPARED BY WM. SYDOW, DIRECTOR OF PUBLIC SERVICE, MIAMI

GARBAGE AND TRASH COLLECTION

Year	Labor Hours	Truck Loads	Tons of Refuse Col.	Payroll	Truck Maintenance	Supervision & Overhead	Total	Unit Cost per Ton
1929-1930.....	156,951	17,821	43,932 72	$81,825 17	$16,700 05	$17,460 90	$115,986 12	$2.64
1930-1931.....	145,225	16,906	41,261 50	76,068 09	13,900 57	16,042 82	106,411 48	2 57
1931-1932.....	134,893	18,465	41,682 09	67,190 67	12,710 76	13,978 16	93,879 59	2.25
1932-1933.....	114,507	12,694	35,922 25	49,223 17	10,358 41	13,632 45	73,214 04	2 04
July to December, 1933, inclusive.....	72,136	6,449	17,070 80	25,579 00	7,478 49	6,135 65	39,193 14	2 30

INCINERATION

Year	Labor Hours	Tons Ashes	Tons Refuse Burned	Payroll	Truck Maintenance	Supervision & Overhead	Miscellaneous	Total	Unit Cost per Ton
1929-1930.....	72,292	14,669 47	63,823 58	$26,927 49	$1,794 07	$7,625 01	$3,491 91	$39,838 48	$0.62
1930-1931.....	81,140	15,621 16	63,818 72	29,999 26	2,985 01	7,843 77	2,285 90	43,113 94	0 67
1931-1932.....	83,991	14,529 00	62,165 26	28,006 51	1,965 00	8,965 46	4,673 55	43,610 52	0.70
1932-1933.....	87,608	17,858 24	59,419 85	22,117 47	1,295 90	8,743 02	2,634 01	34,790 40	0 59
July to December, 1933, inclusive.....	45,388	8,694 18	27,842 20	11,330 28	1,343 92	4,274 72	3,256 72	20,205 64	0.73

NEWS *For Every Public Official*

An Automatic Electric Fire Alarm Unit for Public Buildings

Gamewell VITALARM Signal

Actual Size

Now, every municipal building can have reliable automatic fire alarm protection in convenient form.

This new automatic fire alarm unit known as the Gamewell VITALARM Signal, can be plugged into any standard light socket. It has *two* detectors and a loud alarm howler in the one unit. It operates on the two best known principles of automatic fire alarm, having both the "rate of rise" and "fixed" thermostats. Catches the fire quickly and surely—frankly, it is an amazing device for discovering fire and arousing the occupants of any building.

The life hazard in public schools, hospitals, institutions and auditoriums can be greatly reduced through the installation of the VITALARM Signal. Other public property and records can be protected also by equipping city halls, libraries, garages, water works, fire and police stations, etc.

Every municipal official should become acquainted with the VITALARM Signal—a product of the world's leading fire alarm manufacturer. We'll be glad to mail you complete descriptive literature.

THE GAMEWELL COMPANY
Newton, Massachusetts

Typical Installations

Fire and Accident Prevention

N. F. P. A. Creates National Organization for Volunteer Firemen

DURING the past year the fire losses in the larger cities of the country have shown a material reduction, but the losses in the smaller cities and towns and in the rural districts have been increasing. Because of this fact the National Fire Protection Association during the past few months has organized a Volunteer Firemen's Section, which is designed to provide helpful information and assistance to the volunteer fire departments throughout the United States and Canada. All the small towns, and some cities and towns of fairly large size, depend upon volunteer fire departments, or departments with only a few paid men for their fire protection.

There are approximately 12,000 volunteer fire departments in the United States and Canada, and the N.F.P.A. has communicated with every one of the departments, inviting them to join in this national movement. The volunteers have shown widespread interest and cordial response to the organization of this new section. During the past three months over 1,200 volunteer firemen have affiliated with the section. The new section has received the endorsement of the state firemen's associations in New York, Pennsylvania, Nebraska, Illinois, Rhode Island and Utah, and has been endorsed by state fire marshals in Illinois, Iowa, Texas, Maryland, Minnesota, Mississippi, Montana, Nebraska, Washington and Wisconsin. The National Fire Protection Association is publishing a monthly journal especially written for volunteer firemen about problems with which they come in contact. The plan of membership for the section provides that each individual volunteer fireman affiliated receives a copy of the monthly bulletin, and that the fire company receives (at its headquarters) all the regular literature issued by the National Fire Protection Association.

The work of the N.F.P.A. has hitherto been largely limited to the larger municipalities and to industry, and the Association believes that by expanding its activities into this very much broader field it can render a valuable additional service towards the reduction of the fire loss.

Systematizing Fire Records

"CITIES can save money by putting their fire records in systematic shape," declares DeWayne E. Nolting, of the Municipal Finance Officers' Association, in a pamphlet telling in detail about the model records system installed by Cincinnati the first of this year. Cincinnati is the first city in the United States to put in a system which enables analysis of the work of the Department on a standardized basis. This makes possible study toward economies."

Savings to the community arise out of prevention of future fires and consequent reduction of insurance rates. Only by keeping fire records by causes and census tracts or other small division, and setting up a standardized procedure for investigating fires, can comparisons and studies be made. A uniform plan of records among cities, Mr. Nolting points out, would lead to making possible still more valuable comparisons.

Under the new reporting system, Cincinnati fire records are held down to a consolidated daily and a consolidated monthly report, thus eliminating useless records. There is a uniform system also for keeping inspection and buildings records in each company. A consolidated personnel record of each fireman— recording creditable and meritorious actions as well as reprimands and charges —is kept on file. Another important record is the card file in each company district showing in major buildings sprinkler shut-offs, location of hazards, and other details for information of the firemen.

Cincinnati is operating the new system through its Bureau of Fire Prevention.

Reduction in Child Deaths from Street Accidents in New York City

THE Police Department of New York City published in the December issue of *Street Accidents* figures which show a new low mark in child deaths from street accidents in the city during the first eleven months of 1933—21 less than for a similar period last year. Since 1922, when 477 children were killed on the city streets, there has been, says the report, "a continued, progressive reduction year after year, with one exception, until the toll has been cut almost in half.

"Increased activities in the field of safety education, and particularly through the cooperative efforts of the public and parochial schools and the Police Department, have been an important factor in this encouraging decrease. . . . In 1931 the publication of *Street Accidents* was started and copies were sent into every school in the city. A course for school teachers in safety education at the Police Academy has resulted in a well-planned safety program in schools throughout the city. . . .

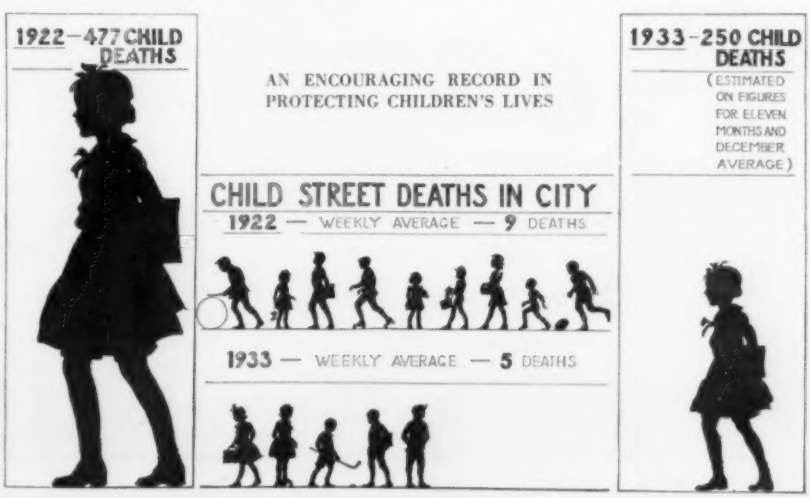
"The reduction in accidents among children of school age has been, in the last decade, even more marked than for the entire child group. About 45 per cent of the children killed are 6 and under, and accidents of this type must be attributed in the main to a lack of proper parental care, rather than to failure to train the child in personal carefulness. The figures for 1933, however, show a decrease of 11 deaths in the 6-year-and-under age group and 10 in the over-16 group."

Safety Education to Reduce CWA Accidents

"IN spite of the fact that organized safety work has been carried on in leading industries for 20 years or more, the first reports of accidents sustained by CWA workers indicate that we must begin at the very beginning to educate our 4,000,000 employees in safe practices."

This statement was made last month by Sidney J. Williams, Safety Director of the Federal Civil Works Administration, after completing a tour of inspection of the Southern States. Mr. Williams has been lent by the National Safety Council to organize a safety-education campaign on CWA projects throughout the country. He estimates that not more than from 15 to 20 per cent of the CWA workers have received any previous safety training.

The types of accidents reported to Harry L. Hopkins, Federal Civil Works Administrator, have corroborated his expectation that a large number of the CWA workers are in poor condition physically or are "soft" and inexperienced in the type of work they are doing.


1922—477 CHILD DEATHS
AN ENCOURAGING RECORD IN PROTECTING CHILDREN'S LIVES
1933—250 CHILD DEATHS
(ESTIMATED ON FIGURES FOR ELEVEN MONTHS AND DECEMBER AVERAGE)
CHILD STREET DEATHS IN CITY
1922 — WEEKLY AVERAGE — 9 DEATHS
1933 — WEEKLY AVERAGE — 5 DEATHS

Again!

GENERAL MOTORS TRUCKS

Take the Lead

●

WITHIN the next thirty days, the General Motors Truck Company will make an important announcement to truck users.

An entirely new GMC truck—especially designed to meet certain *specialized* hauling requirements—will be presented.

This new GMC truck will be an *addition* to the already outstanding GMC line. It will, consequently, give new emphasis to the fact that "there is a GMC to fit every hauling need."

Whether your business can use this type of truck or not, watch for this announcement. Read it. Then—go see the new truck. We believe that this latest GMC will furnish new proof that the General Motors Truck Company is constantly at work to meet haulage conditions with the finest of commercial equipment.

GENERAL MOTORS TRUCKS and Trailers

GENERAL MOTORS TRUCK COMPANY — *Time Payments Available Through Our Own Y. M. A. C.* — PONTIAC, MICHIGAN

FEBRUARY, 1934

Vol. XLIX, No. 2

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

THE AMERICAN CITY advocates:

Streets and roads that are well built, well lighted, well maintained

An abundant supply of clear, safe, palatable water

Sanitary disposal of sewage and garbage

Fire and police departments properly trained and equipped

Traffic control for safety and facilitation; fewer grade crossings

Plenty of parks, parkways, playgrounds, and swimming pools

Banishment of slums, and building of well-planned home neighborhoods

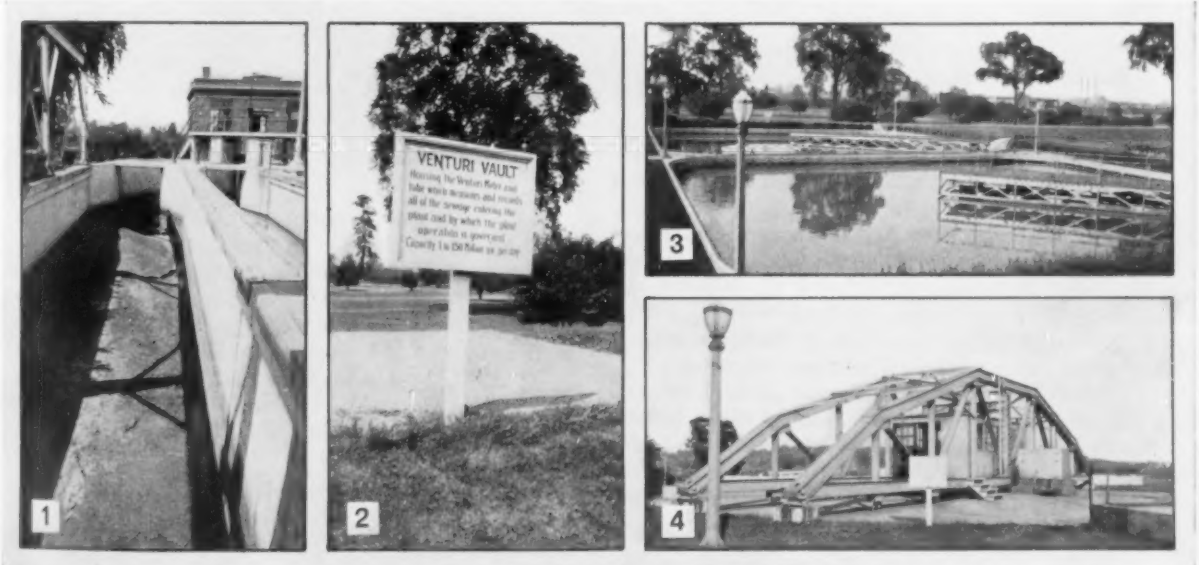
Administrative efficiency and citizenship co-operation in bringing these things to pass

Making a Sewage Treatment Plant Profitable and Attractive

By THEODORE REED KENDALL
Engineering Editor, The American City

ALTHOUGH the Grand Rapids sewage treatment plant is only 2½ years old, and although it does not provide for secondary treatment of sewage, it has started a fertilizer business that has grown by leaps and bounds at no cost to the city. The entire fertilizer factory where Rapidgro fertilizer is processed from the sewage sludge was built from odds and ends at first and then as the income from the fertilizer increased the plant was enlarged by the use of these sums, until now it has become a real plant that operates at a fine profit. It is of course not sufficient to pay for the cost of sewage treatment, but the gross return from fertilizer sales is more than the gross cost of sludge handling.

The plant proper has been designed for a population of 250,000, while the inlet structures were designed for a population of 500,000. All the sewers of Grand Rapids,



OPERATING SCENES AT THE GRAND RAPIDS SEWAGE TREATMENT PLANT

1. One of the grit chambers empty, showing the grit accumulated in one week. 2. Each section of the plant is plainly marked with a sign similar to this, describing the function of the unit in the treatment of the sewage. 3. The Dorr clarifiers in the square settling tanks. 4. One of the sludge digesters, showing the rectangular gas collection dome at the right next to the truss

except for a few small areas developed in the last few years, are combined. Seventy-five per cent of the sewage delivered to the plant comes via the Market Avenue pumping station, where it is lifted 18 feet, and it flows the remainder of the distance by gravity. The other 25 per cent of the sewage comes from the southeast or Silver Creek Valley section, which includes East Grand Rapids. The two sewers combine at the plant in a raw sewage conduit 6 feet high and 8 feet wide.

Screening

Originally the plant was equipped with one set of coarse screens, and after a second set was installed the amount of rags caught was greatly increased. The screenings amount to 0.4- to 0.6-cubic foot per million gallons, which with the average flow of 25 mgd at this plant gives about 15 cubic feet daily. The screenings are raked off by hand onto a drying rack. When dry, they are loaded onto industrial railway cars and hauled out to a field and buried. It is planned to dispose of the screenings in the future either by burning them with sewage gas or grinding and putting them back into the sewage flow. The latter way is preferred by those in charge.

The Grit Chamber

From the screens the sewage flows to the grit chamber, which has five passages, three of which are 8 feet wide, and two 10 feet wide. As the rate of flow of sewage through the plant is controlled practically by the rate of pumping, the operator on duty at the pumping station telephones the plant whenever he is making a change in the volume of sewage pumped, and the five-way gates at the head of the grit chamber are shifted accordingly. The gates are of Brown & Brown, Lima, Ohio, make, and work very easily. The velocity of the sewage through the grit chambers is from 0.9 to 1.1 feet per second. With normal operation the deposited material contains from 3 to 7 per cent putrescible material but it has run as high as 43 per cent organic matter, owing to large quantities of mash emptied into the sewers, and it has been found that the mash has about the same rate of settling as grit.

About 28 cubic yards of grit are deposited each week in the grit channels, the amount varying from 4 to 98 cubic yards. One pair of channels are cleaned each week, and the grit is used for fill in low spots around the plant. It is planned to dispose of the grit by handling it hydraulically. An experimental hopper and chute have been tried out and found successful. The influent sample for the plant is taken each hour during the 24 at the effluent end of the grit chamber by a small container on the end of a long bamboo pole and deposited in an insulated container which prevents the sample from becoming heated in summer and freezing in winter. A similar station is located at the control chamber for effluent samples.

The quantity of sewage treated at the plant is recorded by a Simplex venturi meter located between the grit chamber and the control house, from which the sewage is distributed to the four settling tanks. The recorder for the meter is located in the pump house about 360 feet distant.

The Control House

The control house, which at first appears to be merely a small brick building of no particular importance, attractively surrounded with shrubbery, is really very important now and in the future development of the plant. It contains the switches for the primary clarifiers and the lights in that section of the plant, locker rooms for the men and for the storage of tools, and for the emergency electric lights which have long, heavy-duty cords so that they may be plugged in at any point and used wherever there is a break or trouble after dark.

The lower section of the control house contains the inlet conduit from the meter, leading to the four clarifiers. The flow of sewage is divided in the control house into two sections flowing through two parallel conduits out to the settling tanks. Each of these conduits flows to two Dorr clarifiers. Space at the rear of the control house, now devoted to grass and planting, has been left for a future installation of four more clarifiers.

As the city has been ordered by the State Department of Health to chlorinate the effluent of the plant before discharge into the river, plans have been made, and will be put into effect as soon as money is available, to add one story to the control house for the installation of the chlorinators and to use 1-ton containers brought into the house by a monorail from the roadway about 100 feet distant. The present hand-operated valves for the flow to the clarifiers will be changed to operate electrically, for the present rising valve stems would be in the way of the handling of the chlorine containers.

The Clarifiers

The inlet channels from the control house to the clarifiers are aerated to keep the suspended solids in suspension, for the entry ports or slots from the channels to the clarifier tanks are rather high in the sides of the channels. Blowing also demulsifies the hydrocarbons so that they may be skimmed from the surface by the skimming device on the Dorr traction clarifier. This is very important from the standpoint of the manufacture of fertilizer, since all grease must be removed from the sludge or else the fertilizer will not readily combine with the soil when applied. The blowing also helps remove some of the odor from the sewage.

The combined scum from the clarifiers and the sludge digesters runs about 9,000 Btu per dry pound and hence has fuel possibilities. It is about 25 per cent ash. The sludge cake has about 4,300 Btu used as a fuel and runs 50 per cent ash.

Digesters and Pumping Station

There are four Dorr sludge digesters, each 70 feet in diameter, with gas domes which have been developed at the plant. They consist of the original rectangular domes somewhat enlarged and with a diagonal partition or baffle inserted to keep the foam out of the gas line. The domes measure 6 feet long, 5 feet high, and 3½ feet wide. A small water line is carried into the dome and sprays the top of the baffle plate so as to wash any foam down into the digester. The gas line is brought up to the top of the dome well above the baffle plate, so that it is protected from the foam.

At present only two of the digesters are in use and these produce about 83,500 cubic feet of gas per day each. An endeavor is made to get the least possible reduction in volatile matter and yet produce a stable sludge. At present the reduction in volatile matter runs about 55 per cent.

The sludge pumping station is located in the area between the four digesters and handles the primary sludge to

the digesters, and the digested sludge to storage or to the drying beds. The Simplex recording chart for the flow of raw sewage is located in this pump station.

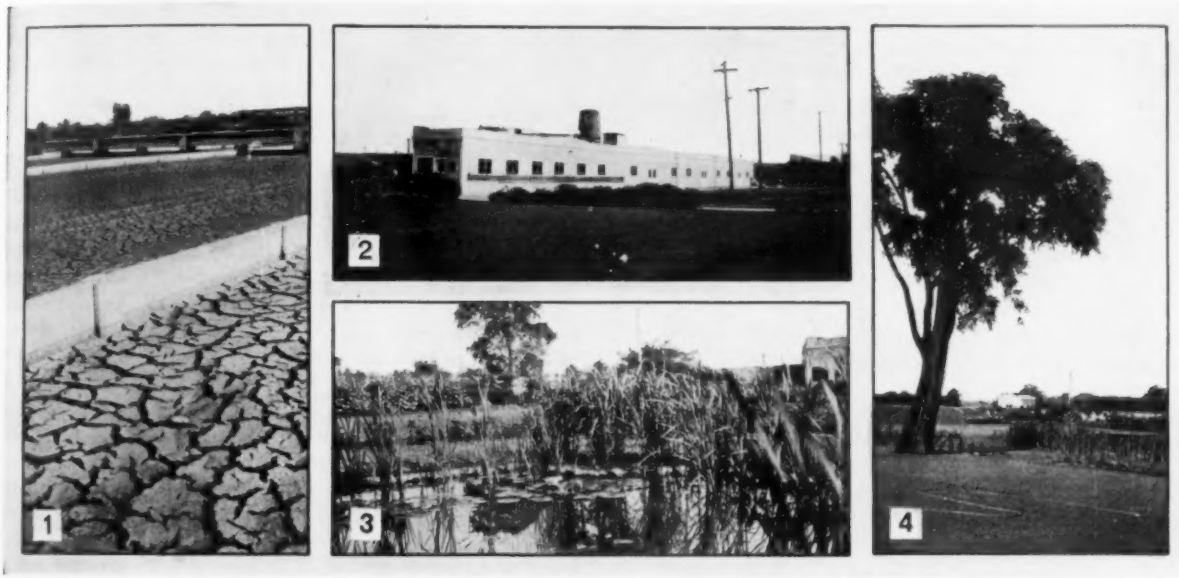
Originally it was planned to have a meter in each tank for the raw sludge pump to the digester and the digested sludge pumped out. By running a double loop of pipe around the four walls of the station with connections to the four digesters, it was possible to handle the entire metering of sludge with an 8-inch venturi for the raw sludge, and a 6-inch venturi for the digested sludge.

The Barnes sludge pumps are equipped with hinge valves instead of the usual ball valves for this type of work. It is necessary to renew the valve seats every three or four weeks with a 5-inch canvas rubber impregnated belt. The pumps are driven by motors through rope drives for steady work. In the pumping station on a lower level is located a Bryant gas boiler with a capacity of 2,200,000 Btu per hour for heating the water for the digester coils, and in winter it also heats all the buildings. The heating lines, other than in the large tunnels or galleries, have a unique method of installation. Short sections of pipe are laid in the bottom of a conduit transverse to the heating line to act as expansion rollers. The conduit is built up of a wooden box 6 inches square encased in 6 inches of concrete all around. Two 1½-inch Dayton-Dowd centrifugal pumps deliver 120 gpm of hot water to the four digesters. The outgoing water has a temperature of 114°, and the returning water 104° F.

A Connersville gas meter is installed to measure the gas production of each tank, making it possible to study the gas production under any different conditions set up in any grouping of the tanks. Each tank has a 60-foot monel metal, nitrogen-filled bulb running across close to the diameter, but just missing the stirring device which records the average temperature in the sludge. This temperature, which runs about 90 degrees, is recorded for each digester on a separate Bristol recording gage in the pumping station. The gas after metering is run through an excess gas trap, and the gas not needed for the boiler goes to an outside burner. The gas which goes to the boiler goes through a flame trap to prevent any possibility of a backfire with the attendant disaster.

Located in the lower section of the pumping station is a separate pumping station for the sewage from the Pere Marquette shops close by and the plant sewage. Two Yeomans vertical pumps with Howell motors are installed and controlled automatically by a transfer switch, so that after a certain amount of current has been run through the motor of one pump, the other is placed in service.

All valves throughout the plant are from the Traverse City Iron Works, and the hydraulic valves are O. S. & Y. units, which are economical in repairs. They consist of brass sleeves made of tubing with cast iron heads and rods. If for any reason the sleeve bulges from excessive pressure or freezing, the piston still works, although not so efficiently. If it breaks, it is necessary only to replace a short section of brass tubing properly machined on the two ends. All the valves for the four digesters are hydraulically operated, but globe valves with a right-angle turn are also installed to use in case the hydraulic valves fail to operate. These latter valves permit the sludge to flow to the underdrainage system and then to the drainage pump and back to the clarifiers.



FERTILIZER AND FLORICULTURE AT THE SEWAGE WORKS

1. The open sludge drying beds. 2. The fertilizer factory. 3. The lily pond in the central section of the sewage works, where many prize-winning specimens have been grown. 4. A noble tree in a velvet lawn adjacent to the lily pond

All pipes are indicated in definite colors, so that in any part of the plant a man knows just what the character of the pipe is. For instance, all flushing, high-pressure lines are painted blue; red indicates drinking water; gray indicates secondary voltage conduit; brilliant red indicates primary voltage conduit; green, hot water; yellow, return hot water; and brown, gas and so on.

One 6-inch and one 10-inch Dayton-Dowd drainage pump take care of the surface and ground water at the plant as well as the underdrainage, which all flows to a wet well, from which these pumps take suction and deliver the drainage to the control house, or to the river if it is in flood stage.

All air blown to the inlet channels by the Connersville blowers is filtered through an American Air Mat filter consisting of six layers of paper impregnated with oil. A Buda gas engine using sewage sludge gas drives the Connersville blower, which has a capacity of 600 cubic feet of air per minute at 3½ pounds pressure when operating at 920 rpm. The second blower is a Roots, driven at 575 rpm by a Westinghouse motor and delivering 600 cubic feet per minute at the same pressure.

The cost of the gas engine installation was $1,179 and a total of $1,400 with the filter and all connections. An interesting comparison of the costs of operation electrically and with the methane gas which is produced in the digesters shows a considerable balance in favor of the gas engine. Power costs the city 1.75 cents per kwhr, and the Westinghouse motor consumes 10.25 kilowatts. Last year, running continuously, the power bill was $1,533.

The Buda gas engine runs all but two hours a week and uses $100 of lubricating oil, and $25 for spark plugs, which are special for this kind of gas; the carrying charges on the $1,400 investment are $298, and this shows a saving of about $1,100 over electricity at the present rate. Even if the city makes a new contract at the lowest rate allowed, 1.1 cent per kwhr, the Buda engine will still save $700 a year over electrical operation.

Sludge Disposal and Fertilizer Manufacture

There are five acres of sludge drying beds to which the sludge is run from the storage tanks by gravity when they are full, or pumped by the rehandling pumps located in the end of the sludge storage pipe gallery. The sludge storage tank is 220 feet long, 110 feet wide and 24 feet deep. During the winter all of the sludge is stored here. Two Barnes sludge pumps and a Yeomans centrifugal handle the delivery of the sludge to the beds after the top has run off by gravity.

After drying on the sludge beds, the sludge is hand-loaded into industrial railway side-dump cars and hauled to the fertilizer plant, where Rapidgro fertilizer is produced from the sludge cake. The industrial cars dump a trainload at a time into a long hopper at the side of the fertilizer building. This hopper holds about 50 cubic yards of the dried cake. At the bottom of the hopper is a chain drag conveyor which carries the sludge to a crusher, made at the plant and consisting of two cylinders studded with teeth and running at different speeds so that the sludge cake is torn apart into pieces the maximum size of which is about the size of a man's fist. The material is delivered by a 15-foot belt conveyor to an International-Harvester farmers' hammer mill, the draft from the hammers of which is sufficient to blow the pulverized sludge into the inside drum of the drier. This pulverizer is a little too small for the plant when working to capacity, and is to be replaced with a Jeffrey pulverizer.

The drier consists of two shells, the outer of which is 60 inches in diameter and the inner 48 inches. The drier is 52 feet long. The inside drum has vanes which throw the material ahead, and there are four sets of lifting trays which pick up the material at each revolution and cascade it through the current of hot air. A methane gas burner between the two drums provides the heat for drying. The heat travels the full length of the drier between the shells and returns through the inner shell. This drier removes about 7 tons of water from the sludge in an 8-hour working day. The air from the drier is exhausted with a No. 2½ American Sirroco fan. A hood at the end of the drier prevents the material from getting into the outside shell and allows the heat to enter the inner shell.

At the discharge end of the drier the material drops through a chute to a bucket elevator, which raises it to a horizontal screw conveyor, the first 24 feet of which has a screen in the bottom with ⅛-inch circular holes permitting the fines to drop into a parallel screw conveyor running in the opposite direction. All oversize material goes back to the storage bin to be reprocessed. The fines are collected in a home-made hopper rigged for bagging. Platform scales are set beneath the hopper, and the bags are filled directly from the hopper with 110 pounds of the dried sludge cake now known as Rapidgro fertilizer. When the hopper is full, the remainder automatically continues along in the conveyor to a warehouse, where a total of 401 tons of fertilizer can be stored.

The whole power for the plant is supplied by a Wisconsin motor run by methane gas and belted to a long jackshaft. The engine operates at 700 rpm and supplies 50 hp to the shaft. The fertilizer plant equipment complete with the building cost $2,000, plus another $2,000 for labor to build it. This last sum was not actually expended, but is charged to the cost of the plant to give a fair idea of the cost. The labor used was plant labor on the monthly payroll at times when other work was slack, plus some welfare labor that was sent to the plant.

A conservative analysis of Rapidgro fertilizer shows 2½ per cent nitrogen as ammonia and from 2.75 to 3.00 per cent phosphoric acid, and 0.3 per cent water soluble potash. The humus runs between 35 and 40 per cent. In 1932 a total of 11,000 bags of Rapidgro fertilizer was marketed from the plant without any advertising, and much was supplied free to the city parks and was used at the plant for the grounds and for the welfare vegetable gardens. In June, 1933, the plant was ready to take care of the needs of the welfare gardens and its customers. The welfare gardens used 100 tons, a customer had an order in for 100 tons, and the regular demand amounted to between 30 and 40 bags a day to customers in the city. The fertilizer sells for 65 cents per 110-pound bag delivered in Grand Rapids or East Grand Rapids. At the plant it sells for 55 cents per bag, and in lots of 20 or more bags at 50 cents per bag. It is delivered anywhere at the plant price plus $1.50 per hour delivery charge, but this type of delivery is not fostered, since it tends to bring orders from distant points where the profit is lost in the delivery.

There were 25 acres of welfare gardens at the plant which produced 4,000 crates of edible produce in 1932, and this was doubled in 1933. There is also an experimental garden where Rapidgro fertilizer is used in varying quantities with various plants and vegetables to determine the proper amount. An electric hotbed makes it possible to start plants earlier than in the cold frames nearby, and a greenhouse costs nothing to operate, for it is heated from the waste heat of the digesters.

The Grand Rapids sewage treatment plant is operated under the direct supervision of James R. Rumsey, Superintendent, whose watchful care and abundance of ideas have done much to create the profitable fertilizer business and the attractive grounds, which include many flower-beds, a prize display of tulips, and a water garden, the lilies from which have won prizes in flower shows.

The TVA Freeway

By **EARLE S. DRAPER**

Director of Land Planning and Housing, Tennessee Valley Authority

VISITORS to the Norris Dam, now being built by the Tennessee Valley Authority on the Clinch River near Knoxville, will approach the lofty structure by a 21-mile "freeway," 250 feet wide and destined to become a scenic highway. The freeway will run across the top of the new dam and connect two important highways leading out of Knoxville, U. S. 25-W to the north and Tennessee No. 33 to the northeast.

The new drive probably will be open to traffic by midsummer of 1934. Motorists will not be able to cross the river at this point until the dam is completed, but the freeway approach on the west side will be paved by March 1, and a crushed rock surface will be laid on the east approach by July 1, 1934. Landscaping, planting and the adding of other final details to the freeway will continue while the dam is under construction.

The freeway is to differ from regular state and Federal highways. Its right-of-way is several times as wide, and no unsightly billboards, filling stations, roadside eating places or other eyesores are permitted along its margins. Nor is it a conventional parkway or boulevard, such as are found in the vicinity of many large American cities. A freeway, as planned by the Authority, will be simply a wide rural roadway, designed with regard for landscape beauty, safety, land use and highway utility. Its construction is under the supervision of J. W. Bradner, Jr., of the TVA.

The first stretch, of five miles, is being built primarily as a heavy-duty highway over which to haul materials from the TVA railhead at the town of Coal Creek, Tenn., on U. S. 25-W, to the west abutment of the Norris Dam. At present, 22-foot-wide concrete paving is being laid over this west approach to the dam.

When the Norris Dam is completed, the freeway across it will offer the motorist an interesting view on either side. To the north will lie a placid 82-square-mile lake formed by the dam. To the south, just beyond the dam's guardrail, will be the spillways through which the flood flows of Clinch River will drop, from a height greater than Niagara, to join the broad Tennessee 80 miles away. Crossing the dam's crest, the freeway will extend southwesterly for 16 miles to Hall's Cross Roads, encircling the Norris, Tenn., construction camp and townsite, a development no less interesting than the dam itself.

TYPE OF CONCRETE BRIDGE USED ON THE TVA FREEWAY

THERE WILL BE NO UNCONTROLLED ROADSIDE CONSTRUCTION ON THE TVA FREEWAY
Its actual appearance will be as shown on the front cover of this issue

Planning for Safety and Beauty

The freeway has been designed as a natural development, rather than a gashed line of communication between two points. Literally, it has been molded into the earth—a man-made structure treated as a natural formation. Instead of being just another "ribbon of concrete," it flows along and around the slopes of the ground and through the valleys and hollows as naturally as a mountain stream finding its way to the river. But this is accomplished without affectation. In no particular is the freeway to be *forced* into position merely for the sake of making a pretty road. This is a case where it was found less expensive, and more desirable in every way, to fit the roadway to the earth rather than to attempt to fit the earth to the roadway.

The freeway is insured against encroachment by man-built clutter. Roadside stands, signs and shacks will be definitely prohibited throughout the entire length of the 250-foot-wide right-of-way. Not only that, but the location of future intersections by other roads will be subject to control by the Authority. This control will act to check the "development" of sporadic subdivisions along the freeway, thus eliminating unsightly, if not positively dangerous, grid-pattern streets intercepting the free flow of traffic. At some future period, when justified by the density of traffic, overcrossings and underpasses will probably be employed as a further means of eliminating the few road crossings which might threaten the free and secure flow of traffic along the freeway. Filling stations, restaurants and such other roadside buildings as may be necessary will be required to conform to TVA architectural specifications. Thus, without sacrifice of convenience or

utility, such structures will harmonize with their natural settings.

The freeway extends through a region that ranges from the rugged bluffs along the river through deep mountain forests broken here and there by upland meadows and coves. Wherever open spaces add nothing to the attractiveness of the view, or where shade is needed, they will be eliminated by planting. On the other hand, in a few cases moderate thinning of the natural growth will be resorted to for the sake of exposing some otherwise hidden point of interest, such as an unusual sweep of river or valley, or a dominant mountain height.

Wherever permanent planting is done along the freeway, only shrubs and other growths gathered from the immediate locality will be used, thus serving both economy and good taste. Such planting will be used to relieve harsh contrasts between wooded ground and open spaces and to soften and harmonize nearby borders and edges along the wayside.

Of a more definitely practical nature will be the correction and prevention of erosion where needed along the way. This will be accomplished by means of grasses, vines and other ground-covers with close-growing root systems to reinforce the ground against washing, and by establishing larger plants along slopes and banks to break the force of heavy rainfall.

Special attention has been given to routing the freeway so as to avoid heavy cuts and fills, thus avoiding expensive construction costs as well as minimizing repairs and maintenance work in the future.

Throughout its length the freeway will emphasize the natural surroundings without attempting to imitate an attenuated urban parkway. The views will be ever-shifting with glimpses here and there of a distant mountain range or the gleam of sparkling water through the trees. Though designed for beauty as well as utility, the new TVA freeway will be as simple and unaffected as any rural roadway.

EDITORIAL NOTE.—See also "The new TVA Town of Norris, Tennessee," by Earle S. Draper, in the December, 1933, issue of THE AMERICAN CITY. For "General Information," issued by the Tennessee Valley Authority December, 1933, in 25 mimeographed pages, address the Authority at Knoxville, Tenn., or at Temporary F Building, Washington, D. C.

The General Principles of Municipal Accounting

As Formulated by the Newly Organized National Committee on Municipal Accounting

THE organization of the National Committee on Municipal Accounting, in Chicago on January 6, holds greater promise for the improvement of municipal accounting than any movement previously undertaken. It is the first effort on a national scale to establish principles and standards for municipal accounting and actively promote their use. It brings together for constructive work the representatives of the primary groups concerned in municipal accounting. The same associations will promote the use of the standards when they have been developed.

The general committee as now constituted is as follows:

F. H. Elwell, Professor of Accounting, University of Wisconsin—American Association of University Instructors of Accounting
Lloyd Morey, Comptroller, University of Illinois—American Institute of Accountants
L. M. Barnard, Senior Public Accountant, League of Kansas Municipalities—American Municipal Association
George P. Ellis, President, American Society of Certified Public Accountants
H. C. Laughlin, City Manager, Kenosha, Wis.—The International City Managers' Association
Frank J. Flanagan, Finance Committee Staff, City of Chicago—Municipal Finance Officers' Association
A. E. Neale, City Auditor, Springfield, Mass.—National Association of Cost Accountants
Edmund R. Stewart, State Auditor of Maryland—National Association of State Auditors, Comptrollers, and Treasurers
Lent D. Upson, Director, Detroit Bureau of Governmental Research—National Municipal League
Stuart A. Rice, Assistant Director, Bureau of the Census

The elected officers of the National Committee on Municipal Accounting are: Chairman, Frank J. Flanagan; Vice-Chairman, Lloyd Morey; Secretary, Carl H. Chatters. The Chairman, Vice-Chairman, and F. H. Elwell form the Executive Committee.

There has long been need for a concise statement of the general principles of municipal accounting. At its first meeting, therefore, the National Committee on Municipal Accounting adopted tentatively certain principles as a guide to its activities:

The accounts should be centralized under the direction of one officer, who should be made responsible for keeping or supervising the keeping of all financial records, and preparing all financial reports.

The general accounting system should be on a double entry basis with a general ledger maintained in accordance with the following principles:

(a) The accounts should be classified in balanced fund groups.
(b) Asset accounts for permanent property not available to meet expenditures or obligations should be segregated from other fund assets and the equity represented by them not included in the current surplus of any fund.

The following classification of funds is recommended:

(a) General fund
(b) Special revenue funds
(c) Utility funds
(d) Bond funds
(e) Special assessment funds
(f) Trust and pension funds
(h) Sinking funds
(g) Agency funds

The general accounting system should include budgetary control accounts of revenues, expenditures, appropriations, and encumbrances.

Revenue should be accounted for through the budgetary control accounts. If revenue is accounted for on an accrual basis by taking into the accounts each item when it becomes due or a bill is issued for it, the reports should be prepared on that basis. In this case suitable provision should be made for possible losses through inability to collect. If revenue is accounted for on a cash basis, meaning that an item is considered revenue only when it is collected in cash, the reports should be prepared on that basis. In either case all items of a non-revenue character should be excluded from reports of revenue. Revenues should be classified by fund and by source, in accordance with standard classifications.

Expenditures should be accounted for through the budgetary control accounts and on such a basis as to take into the accounts all material used or services rendered during a given period. Suitable provision out of the appropriations of the current period should be made for encumbrances for which material or services are not yet received or rendered. Expenditures should be classified by fund, by department, and by activities, and by object if desired, in accordance with standard classifications.

There should be a system of unit cost accounting in which costs are allocated to the various activities in the respective departments. This system should be coordinated with the general accounting system.

There should be inventory records of both consumable and permanent property, and the records of property should be subsidiary to and controlled by accounts in the general accounting system. The asset accounts of property should be maintained on the basis of original cost, or estimated cost if the original cost is not available, or, in the case of gifts, the appraised value at the time received. If current valuations are desired, for insurance or statistical purposes, they should be computed independently from the books and not carried into the accounts. It is not considered necessary to account for depreciation of general municipal property, except for unit cost purposes, unless cash can legally be set aside for replacements.

The accounting for public utilities or other business enterprises operated by the city should follow the standard procedure employed by similar enterprises under private ownership. The accounting for public institutions such as colleges, hospitals and libraries should follow the standard procedure employed by such class of institutions.

Street Maintenance Programs for 1934

More Cities Report Plans for Rehabilitation of City Streets

IN the January issue of THE AMERICAN CITY reports were published from a number of cities in different parts of the country showing their plans for street maintenance during the first six months of 1934. This survey has been continued and below are stated the plans of other cities.

Athens, Ohio

About 15,000 square yards of brick pavement in Athens is to be relaid on a new sand cushion at a cost of about $27,500 as a CWA project, requiring 157,000 new 3-inch brick and 130 tons asphalt filler.—J. W. DOWLER, City Engineer.

Bismarck, N. Dak.

Considerable work is under way on the city streets of Bismarck in conjunction with the CWA, and it is doubtful that any further work will be done other than the absolute minimum maintenance which will be necessary.—T. R. ATKINSON, City Engineer.

Borough of Brooklyn, New York City, N. Y.

The maintenance program of the Bureau of Highways, Borough of Brooklyn, calls for an expenditure of about $800,000 to take care of the necessary repairs to about 1,200 miles of paved streets and to about 125 miles of dirt roads. This work will entail the purchase of 5,000 barrels of portland cement, 450,000 gallons of asphaltic cement, 80,000 gallons of asphalt road oil, 15,000 cubic yards of asphalt sand, 4,000 cubic yards of concrete sand, 12,000 cubic yards of binder stone, 2,500 tons of limestone dust, 2,000 cubic yards of gravel, 8,000 cubic yards of broken stone, and 8,000 cubic yards of cinders.—WILLIS R. TENNEY, Chief Engineer.

Clarksdale, Miss.

Grading, regraveling and resurfacing will constitute the main items of the maintenance program in Clarksdale. Kentucky rock asphalt is used for resurfacing the paved streets. The total cost of the early maintenance program for 1934 is $9,500.—WALTER S. BORO, City Engineer.

Cleveland Heights, Ohio

The street maintenance program in Cleveland Heights for May and June, 1934, will cost about $30,000, will use local unemployed men and involve the purchase of 60,000 gallons of cut-back asphalt, 2,000 tons of crushed stone or slag, 500 square yards of asphalt, and 200 square yards of brick.—F. A. PEASE, City Engineer.

Cohoes, N. Y.

Between $5,000 and $10,000 is to be spent in Cohoes in retreading existing pavements and patching and oiling. Amiesite and standard liquid asphalt are to be purchased for the work.—HUGH MCKEE, City Engineer.

Columbus, Ohio

The regular street maintenance program in Columbus will begin about March 1. During the winter only emergency repairs are made. Repairs are made to brick, asphalt and macadam streets, and the work includes cindering alleys and surface-treating some of the macadam streets. The program for the first half of 1934 will cost about $200,000 and will involve purchases of brick, asphalt, crushed stone, cement, asphalt cut-back, road oil, etc. Welfare workers are being used to grade the unpaved dirt streets.—P. W. MAETZEL, City Engineer.

Dayton, Ohio

About $120,000 is to be expended in Dayton for scarifying and oiling about 200 miles of graveled streets and repairing 1,500 square yards of brick paving, and about 4,000 square yards of asphalt paving. This work will be tied up with the CWA program. About 800 men are used in opening and grading streets, and a larger force will be employed as rapidly as possible.—GEORGE F. BAKER, City Engineer.

East St. Louis, Ill.

With labor furnished by CWA, East St. Louis plans to take up and relay about 25,000 square yards of old brick pavement, at a cost of about $8,500 for the material, which will include 25,000 gallons of asphalt filler, about 100,000 new brick and 1,500 tons of sand.—H. MCK. BROWN, City Engineer.

Fulton, N. Y.

The paved streets of Fulton are being repaired with cold bituminous materials such as Colprovia. Cement concrete will also be used for patching the foundations. The total maintenance expense will be about $1,000, and no new equipment is to be purchased—H. S. ANDREWS, City Engineer.

Gloversville, N. Y.

Gloverville's street maintenance program for 1934 will probably not differ much from 1933. It is expected that about $18,000 will be expended during the first half of the year and will include the purchase of asphalt, cement and miscellaneous tools.—H. J. HAMMER, City Engineer.

Grand Junction, Colo.

The regular routine maintenance work is to be continued in Grand Junction during the first six months of 1934, at a cost of about $6,120, and no new materials or equipment is to be purchased.—J. P. SODERSTRUM, City Manager.

Hannibal, Mo.

Hannibal is depending entirely upon CWA money to the extent of about $30,000 for street grading projects in the city which require $6,000 worth of material, furnished by adjacent property owners.—GEORGE W. FARRELL, City Engineer.

Ishpeming, Mich.

Very little street repair is done during the first six months of the year in Ishpeming. The present work, which is absorbing unemployed labor, is being done under the CWA and includes some road work, the construction of playgrounds and an athletic field, and the installation of sewers and water pipe. For this work there will be purchased sewer pipe, water pipe, fencing, manhole covers, catch-basins, bricks and cement.—J. H. TREBILCOCK, City Engineer.

Jackson, Miss.

The maintenance program in Jackson for January-June, 1934, will consist of pouring cracks on all pavements with asphalt, resurfacing about 24 blocks of worn pavement with sheet asphalt, rebuilding curbs and gutters, and some general repairs, totaling about $10,000 in cost; also $65,000 in CWA street work.—J. J. HALBERT, City Engineer.

Jefferson, Mo.

Grading and setting-back of masonry walls and curbs will make up the maintenance program for the early part of 1934 at a total expense of about $40,000. All the necessary equipment has been purchased, but about 1,800 bags of cement are to be bought later.—RICHARD D. FOWLER, City Engineer.

Jamestown, N. Dak.

For the next six months street maintenance in Jamestown will consist of resurfacing about 40 blocks with oil mix, at a cost of $45,000.—G. R. Horton, City Engineer.

Kansas City, Mo.

About $500,000 is expended annually by the Department of Public Works in Kansas City. Street maintenance, except on pavements that have been laid within a period of five years, is carried on under the jurisdiction of the Department of Street Repairs. The annual expenditure covers repairs to pavements, sidewalks, sewers, bridges and other minor work. The heavy expenditures are during the warm weather, and it is expected that about $190,000 will be spent between January 1 and July 1.—Robert W. Waddell, City Engineer.

Lexington, Ky.

The maintenance for the first six months of 1934 in Lexington will consist principally of repairing holes and depressions in about 45 miles of brick street and about 45 miles of macadam streets, using a cold patch mixture made at the city plant. In April and May it is expected that about 10 to 15 miles of macadam streets will be surface-treated, using from 30,000 to 40,000 gallons of oil. The expenses for this particular maintenance program will be approximately $8,000. —J. White Guyn, City Engineer.

Mamaroneck, N. Y.

Only the usual maintenance will be undertaken during 1934 in Mamaroneck, starting in March. About $7,500 will be expended for materials and $10,000 for labor, and there will be purchases of stone and tar.—R. J. Whitney, Village Manager.

Mandan, N. Dak.

The North Dakota State Highway Department is widening the seven blocks of U. S. Route 10, which runs north and south through Mandan. The city is making repairs to the street and curbs, which will be widened 4 feet on either side.—E. R. Griffin, City Engineer.

Manhattan, Kans.

About $14,000 will be expended in Manhattan in the early part of 1934 for the repair of sidewalks, streets and some sewers. A new storm sewer is to be built at an estimated cost of $46,000. Miscellaneous concrete and asphalt materials and equipment are to be purchased as a part of this program.—Wilbur D. Cole, City Engineer.

Mission, Texas

The maintenance of about 100 blocks of streets which are topped with Uvalde rock asphalt on a gravel base will be continued in Mission's regular maintenance program. The streets are all in fair condition, and the maintenance is not expected to be much during the coming year. It is expected that not much more than $100 will be expended during the coming year. The city hopes to be able to gravel about 30 blocks with 6 inches of pit-run gravel, through a cooperative agreement with the Civil Works Administrator.—E. P. Congdon, City Engineer.

Niagara Falls, N. Y.

The street maintenance in Niagara Falls for the entire year of 1934 will involve the expenditure of about $35,000, all the work being done by the regular city repair force and entailing the purchase of asphaltic cement, sand, stone screenings, binder stone, gravel, fuel oil crack filler, cement and limestone dust.—H. W. Clark, City Engineer.

Norfolk, Va.

About $60,000 is to be spent on the usual repairs for 224 miles of paved streets in Norfolk during the first half of 1934. The budget has been curtailed 50 per cent.—A. B. Pleasant, Assistant City Engineer.

Pampa, Texas

Pampa itself is undertaking no street maintenance, but there is now under construction within the city by the state 2 miles of 60-foot paving, including curb and gutter, caliche base and asphalt top. The repairing or patching of about 800 feet of asphalt street, the repair of concrete curb and gutters, and the grading of all streets from curb to sidewalk with welfare labor, and the construction of about 20 small sectional concrete culverts are a part of the work. The whole program involves the expenditure of about $75,000.—C. L. Stine, City Engineer.

Porterville, Calif.

The normal street maintenance program with oil sand which was made and mixed last summer is to be continued in Porterville. The most important street work is done in July, August and September, owing to the extremely high temperature during that period, which is of considerable help in mixing oil with dirt. The city is also maintaining the state highways within the corporate limits. This expenditure is made from the state gasoline tax funds, which is 0.25-cent per gallon allocated to the cities of California. Porterville's portion is approximately $6,500 for the period July, 1933-July, 1935. The city will probably purchase a grader in July or August to speed up the oil sand mix work.—Delphin G. Spellman, Superintendent of Streets.

Puyallup, Wash.

The street maintenance program of Puyallup for the first half of the year consists of grading the gravel surface roads, the repair of pavements, and crosswalks, storm sewers and side ditches, at a total expense of about $4,000. Wheelbarrows, shovels, picks and other small tools have been purchased.—C. J. Phillips, City Engineer.

Redwood City, Calif.

Only routine maintenance work will be carried on in Redwood City during the first six months of 1934, at a cost of about $6,000, and no purchase of new equipment is planned. —C. L. Dimmitt, City Engineer.

Rhinelander, Wis.

The general maintenance on all streets in Rhinelander will continue through 1934 at a cost of about $2,000.—T. M. Wardwell, City Manager.

Royal Oak, Mich.

The improvement of dirt roads, including ditching, graveling, and adjustments to existing drainage structures, will comprise the major part of the maintenance program in Royal Oak, all of which will be done as CWA work. The total cost will amount to about $165,600 and will involve the purchase of road gravel, lumber, brick, cement, culvert pipe, shovels, picks, etc.—E. M. Shafter, City Manager.

San Bernardino, Calif.

The sum of $23,000 is available in San Bernardino for the first six months of 1934 and will be expended for 1,300 feet of new gutters, and a few new culverts, and to fix broken curbs, fill in low areas in pavements and then treat the entire surface with a seal coat. The idea is to smooth up the surface and increase the riding comfort on as many streets as possible with the funds available. This money is the city's share of a gas tax revenue to the state. The project has been approved by the CWA, and work has been started, liberating the gas tax money for materials and thus greatly broadening the program. This work will necessitate the purchase of a light truck, rock, sand, cement and oil.—Gordon Stewart, City Engineer.

San Mateo, Calif.

The street maintenance program in San Mateo for January-June, 1934, will be limited to the filling of cracks and expansion joints, and the widening and resurfacing of San Mateo Drive, at a cost of about $6,500. The San Mateo Drive project is to be done with CWA funds. The work involves the purchase of rock, sand, cement, emulsified asphalt and brick.—E. P. Wilsey, City Engineer.

A Modern Motor Way in Westchester County

Fairchild Aerial Surveys

One of several striking illustrations from an article in *The Architectural Record* for December, 1933, on "Modern Motor Ways," by Gilmore D. Clarke, Landscape Architect, Westchester County Park System. This airplane view shows one of the overpasses on the Hutchinson River Parkway and the adjoining Maplemoor golf course near White Plains and Harrison, N. Y.

New Methods of Highway Control and Development in Germany

By DR. ING. PH. A. RAPPAPORT
Essen, Germany

BY decree of December 15, 1933, and a previous decree of August 7, increased authority has been given to the special official for all public roads in Germany whose position was created under a law passed on June 27, 1933. "General Inspector of German Roads" is the title given to this official. His work is about the same as that carried out by the Bureau of Public Roads in the United States. Added to this, the General-Inspector is personally responsible for the new special motor roads built in connection with the German Railway Company.

We have in Germany, just as in the United States, state roads, county roads, and single township roads for the use of intercommunal traffic, but the Reich itself has no highways. The town roads are generally only for local traffic, with the exception of roads which connect the highways within the town districts. The highways are kept in order by the states and counties (seldom by the townships). In Prussia the provinces are responsible for the upkeep. The extent of the German highways is, in comparison with those of the United States, not considerable, although the net is more congested than the United States; the whole length of all intercommunal roads in Germany is about 300,000 kilometers (186,000 miles*); it is nearly the same length as the Federal Highway System.

In 1929 for the first time a German Minister of Public Traffic interfered concerning public roads. Then was laid down a system of thoroughfares called "fare-routes," the total length which is about 25,000 km (15,500 miles). These roads are distinguished by special signs painted yellow with black numbers, indicating to the automobilist on which road he is traveling. The signs are similar to those employed by the United States highway system. These thoroughfares are kept in order and improved, as hitherto, by the single states, but rules for road construction were ordered by the Reich and it was expected that the thoroughfares would be improved as soon as possible for the accommodation of motor traffic.

All this was completely changed by the new law passed on June 27, 1933, and the additional amendments above mentioned. Now all public traffic roads are superintended by the General-Inspector of German Roads. It is stated by this law: "The General-Inspector is requested to provide rules and regulations for planning, constructing and improvement in the public road net and to control the carrying out of his instructions, so that all methods are uniform." The construction and upkeep in the small German states varies greatly, and therefore it is most important that standards shall be uniform. But it has not yet been decided whether the Reich itself will improve any of the public roads, most particularly the above-mentioned highway net.

It is more important still for the whole German motor traffic that a new road system is to be built by the Reich, especially for motor traffic and quite independent from all other public roads. The law gives the right to the General-Inspector to make the plan for this new motor road net throughout the whole country, and he is also to decide how it is to be built. No objection can be raised against his final decision. The new motor roads are built by a society connected with the German Railway Company, and the new motor road society has the same right of eminent domain as the railway company itself.

For the beginning, a motor road net of about 6,500 km (4,000 miles) has been planned. The work has already been taken in hand between Frankfort and Mannheim, between Munich and Salzburg, between Cologne and Dortmund (to lengthen the existing motor road just built by the Rhine province).

The Financial Question

"Motor roads" means highways reserved for motor vehicles—trucks, commercial automobiles, passenger cars, motorcycles—and *without any level crossing with other roads, trolley-lines and railways.* A special tax, agreed to by the Minister of Public Traffic, shall be levied on the whole traffic of these motor roads. The rates are not yet fixed, but probably about 2½ pfennigs per kilometer (1¼ cent per mile) will be charged for an ordinary passenger car; and for continuous use it may be that one can subscribe.

Is it preferable to build new roads only for motor cars or to improve the existing highways so as to suit motor traffic, especially to provide new connections round the town centers? This question is, in Germany as in all other countries, an open one. The opponents of these new motor roads think that the existing highways should not be kept up as they are at present, and that no one can justify from the financial point of view the building of new roads when the expense may be about 300,000 reichmarks ($166,000 per mile†). The question of a toll tax is also discussed with animation.

But it is quite certain that the building of new roads is one of the best methods to procure work for unemployed without delay; and nobody can deny that a well-built net of roads to be used only for motor cars is of very great importance, not only for the motor traffic, but also for the existing roads, for we have in Germany a very extensive local traffic and still many horse-drawn vehicles. It is almost certain that the toll tax will yield enough for interest and amortization of the road-building costs. And the tax is justified because the automobilists save a good deal in wear and tear by using these special motor roads. There is one other important item: *the difference which existed between the motor cars and the railways has now been set aside in Germany, because the new motor road society is attached to the railway company and they work in unison.*

* 1 mile = 1.609 kilometers.

† $1 = 2.90 reichmarks.

Central Garages and Transportation Bureaus

Methods Suggested for New York State Cities

ONE of the requisites for satisfactory control of municipal transportation equipment is uniformity, and this is best achieved through centralization. The same men doing the same work and using the same forms will result in uniformity of practice, even if such uniformity is not actively advocated. The tendency will be for habits of work to form around the system as originally installed, and these will pass on from one worker to his successor. The easiest and quickest way for completing work eventually will be found and these methods used. This uniformity may best be obtained through a central garage for any municipality.

Central Control, to Insure Uniformity

The ideal central garage is one that handles all the motor equipment of the municipality. It issues all the gasoline, alcohol and supplies. It inspects and greases all cars and trucks. It repairs all tires. It maintains its own stockroom and employs all mechanics for doing the repair work on the municipal motor equipment. Finally, it keeps records on all phases of the use and care of motor equipment. In the ideal central garage, a coupe used by the Department of Welfare and a delivery truck used by the Board of Education would be repaired by mechanics who punch the same time clock and stand in the same line on pay day. The same maintenance forms would be used on all cars and trucks and all equipment would be on the same inspection schedule. The ideal central garage would be a Transportation Bureau separate and distinct from other branches of the city government and serving all equally.

A central garage, however, no matter how centralized it may be, need not be a Transportation Bureau. If not, it is similar to a private garage caring for the city's equipment, the major difference being that it is municipally administered. The motive of profit is also supposed to be absent.

The Transportation Bureau may be the administrative machine set up to maintain a central garage caring for departmental equipment. In this case the only difference between it and the simple central garage is in its independence or in the wording of the statute creating it. On the other hand, it may be, and no doubt should be, an independent unit furnishing transportation to all branches of the city government, the fire department and perhaps the police department being excepted.

Besides providing a transportation staff agency, such a bureau has the added advantage of being able to control mass care and use. A dispatch plan could be instituted and operated by such a bureau. With central control, any excess equipment or lack of equipment will be noticed immediately and all purchases can therefore be made with a knowedge of the whole situation. There will be no chance, as in a decentralized system, of one department's ordering some material for the use of its mechanics when another department has plenty of the same material on hand. Such material will be all bought at once and in larger quantities, with a consequent decrease in the price per unit purchased. All equipment will receive equally careful treatment, with greasing and inspection on a regular schedule.

Uniform Records, to Determine Unit Costs

The Transportation Bureau, in keeping records of the municipal motor equipment, could soon determine which items of information were essential for proper control. With uniform records being kept on all equipment, unit costs could be found on the same basis, and there would be opportunity to compare such unit costs to advantage. By means of these comparisons, the right type of equipment could be found for each kind of work. Also, with these records, costs could be compared from month to month and a fairly definite average could be set up from which any deviation on the part of any piece of equipment would soon be noted. The reasons for such deviation could be found and remedial steps taken. In the event that charges for the use of certain equipment were placed on various departments, such unit costs could be utilized as a basis for determining the amount of such charges.

A Transportation Bureau would prevent the duplication of buildings, personnel and equipment, and the resultant waste found in decentralized systems.

The Bureau must be brought into being by action of the local legislative body. However, the machinery of the Bureau may be working before there is legal recognition of it, by reason of the fact that those administering the central garage may obtain the necessary voluntary cooperation.

Development of a City Transportation Bureau

The Bureau might well arise from the coordination of various departmental garages, the personnel and equipment of these garages being transferred to a new location or centered in the garage building best suited to expansion. In several New York State cities, such as Albany, Troy, Schenectady, and Utica, large, well-operated Department of Public Works garages exist at present. Legislative action by the municipal councils is all that would be necessary to convert these garages into Transportation Bureaus. Niagara Falls, while not having such a Bureau, has taken a step in that direction. All the city cars are stored in a central storage garage near the City Hall at all times when they are not in use. All of the city's repairs are made by the Department of Public Works repair shop. The physical elements of a Transportation Bureau are present and require only the empowering action of the local legislative body.

There is a possibility that in some instances a private garage might develop into a municipal garage and then into a Transportation Bureau. The transition would come through the municipality's giving all its work to one garage and then either gradually assuming control or buying it outright.

The organization of a Transportation Bureau would

constitute a special local problem in each municipality. It would be influenced by the size of the municipality, the number of motor vehicles in use, and the extent of the existing garage system. In any event, it does not seem necessary to establish elaborate organizations for the control of transportation.

In large municipalities it would probably be desirable to have a special garage purchasing agent. Such a purchasing agent would be under the control of the general municipal purchasing agent. This subordination would be necessary to prevent him from overstepping his bounds and buying materials that the city's agent was purchasing for other branches of the city government. The garage purchasing agent should operate from the office of the city purchasing agent and report to him daily.

In smaller municipalities, the city purchasing agent could well do all purchasing for the garage. In that case, the city's agent would have direct supervision over the storeroom of the garage and purchase on requisition of the Bureau Superintendent.

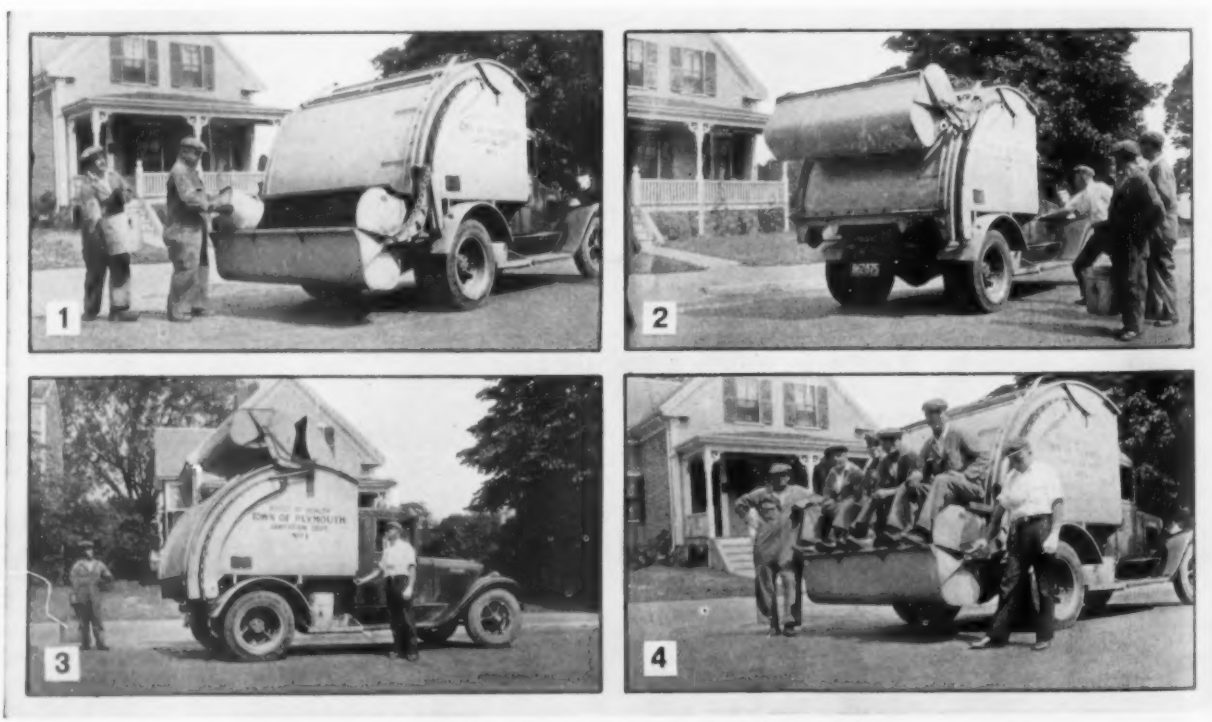
ACKNOWLEDGMENT.—From a report, "The Administration of Municipal Motor Equipment in New York State," by Alwyn A. Greeley. Published by the New York State Conference of Mayors and Other Municipal Officials.

New Sanitary Collection Unit Speeds Garbage Service

Town Collection and Contract Disposal in Plymouth, Mass.

FOR many years the garbage of Plymouth, Mass., was collected by the County Farm and used for feeding hogs, which were sold at a profit to the county. By vote of the Massachusetts Legislature, counties were forbidden to engage in gainful business endeavors, so the County Commissioners were compelled to cease the collection of garbage in Plymouth and to give up the piggery. This law became effective on January 1, 1934, but to be forehanded and not be caught unprepared, the Plymouth Board of Health made arrangements for the collection of garbage by the town and for its disposal by an individual who took over the operation of the county piggery and conducts it as a private enterprise.

The town of Plymouth now pays the county $500 a year as rental for the piggery, in which the county had considerable investment in plant. A contract has been made with an individual who was formerly employed on the county farm in connection with the piggery, and he receives the garbage free for the first year of the contract and thereafter pays increasing amounts to the town each year for a term of five years. The town also has leased the county piggery for five years.



THE COLLECTION TRUCK AND CREW IN PLYMOUTH, MASS.

1. Loading is safe for the collectors, for they are behind the truck out of the way of traffic. 2. The loaded trough on the way up. 3. Dumping the trough into the body. The vertical wired-glass window is clearly shown at the top. 4. The collectors ready for the trip to the next block, via the rumble seat—a board across the top of the trough providing the seat

Collection Regulations

At the annual town meeting on March 25, 1933, the voters decided to have the town collect all garbage. An organization was set up at once under the Board of Health, and the following regulations were drawn up:

1. All garbage material for removal by the town shall be kept in a covered receptacle. Nothing other than garbage shall be placed therein. Underground garbage receptacles are urgently recommended.
2. Nothing other than garbage shall be collected by the town. For the purpose of these regulations garbage is defined as all waste food products.
3. On and after the date of collection of garbage by the town of Plymouth a charge of 12½ cents per barrel shall be made for the collection of garbage from all commercial establishments where the quantity exceeds one barrel (regulation size) on each collection day. For the purpose of these regulations a regulation size barrel shall be 18 inches in diameter and 26 inches deep.
4. Persons using iron receptacles above ground for garbage in cold weather do so at their own risk, as it is practically impossible to remove frozen garbage from an iron receptacle without damaging the receptacle.

Plymouth has a population of about 13,000, from which two collections are made each week during the year. The population is greatly increased during the summer months by transients visiting the historic shrines of the Pilgrim Fathers, and also by those who find this section delightful as a summer resort. Three routes of 30 miles each were laid out for the collection truck to cover twice each week. During June the truck, an International chassis with a Garbage Getter body of 6 cubic yards capacity, traveled 900 miles in its collections. Garbage is collected from 1,200 households per day. This does not cover the entire town, for there are still some five licensed collectors who have been collecting garbage from certain sections for many years. Rather than disturb these men, who have their own hogs to feed, the practice is continued for the present. These men are not permitted to collect indiscriminately, but must remain within the districts allotted to them. The town collects no garbage from these districts.

The collection truck starts out at 7 A.M. and usually has its 6 yards of garbage collected by noon, when it goes to the piggery and delivers the load. It then goes out on the afternoon route, and when the entire allotted route for the day has been collected, the men are free to quit. They usually have finished by 4 P.M. The earliest is about 3 P. M. and the latest about 4.30 P.M. On each delivery at the piggery the truck is washed out, and at the end of the day is given a thorough flushing at a hydrant.

The Collection Truck

The collection truck has a tightly closed body, with the only opening at the top, and this is closed except when the loading trough is raised from its loading position to empty into the top of the body. The trough is at the back of the body, where it can be reached readily by men coming from either side of the street, and is out of the way of traffic. The five collectors who accompany the truck carry 5-gallon galvanized garbage cans into which they empty the householders' cans until the collection can is full, and then they go to the curb and await the arrival of the truck. The cans are dumped into the trough, and usually at the end of each block the trough is filled and raised to empty into the body. The body has a glass observation window about 12 inches long at the top, so that the men can see when the truck body is nearly filled. The emptying of the trough is controlled from the cab and from the side. It is necessary to throw in a clutch in the cab, and then the actual raising is controlled by a lever at the side. This is done so that there will be no chance of adventurous youngsters trying to get a ride up onto the body. The trough can be stopped and reversed at any point. At the piggery the entire body is tipped and dumped through the watertight tailgate.

As the distance between some of the collection blocks is considerable and there might be some delay if the collectors walked the entire distance, they are furnished with transportation in a self-made "rumble seat." A 2 x 12-inch plank is carried along with the truck and is placed on a ledge just above the trough. This serves as a seat for the four men who cannot get into the cab with the driver, who acts as foreman.

The piggery now contains about 200 pigs, which is 100 less than when the county was running it, but the contractors hopes that with an increase in garbage produced and possibly the elimination of some or all of the private collectors, he may be able to increase the number of pigs to 500 and make a better business proposition out of the contract.

THE AMERICAN CITY is indebted to Mrs. Almeda Chandler, Clerk, Plymouth Board of Health, and to R. E. Morse, foreman of collection, for the data on which this article is based. The illustrations are staff photographs.

Recreational Development in 1933

TYPICAL of the projects under way at the end of 1933 in numerous cities in all parts of the United States, as reported by the National Recreation Association, are the following:

For the CWA development of parks and recreational facilities, Birmingham, Ala., is spending $360,000, Knoxville, Tenn., $75,000, and High Point, N. C., $70,000. The city and county projects in Los Angeles, Calif., include, for the PWA, $1,483,000 for beach improvements, and $222,500 for a playground lagoon at Del Rey; for the CWA, $800,000 for the general improvement of 44 playgrounds—tennis courts, fencing, surfacing, rehabilitation of buildings, with $377,000 of CWA funds to be used by the city for tennis courts alone. In California also, Stockton is using $80,000 from the CWA for work on the municipal golf course, for grading and surfacing athletic fields and conditioning grounds for tennis courts, etc., and for baths.

In the far Northwest, Tacoma, Wash., is using $60,000 from the CWA for park development, beaches, wading pool, etc. The CWA projects in Oshkosh, Wis., include bathing beaches, extension of the golf course, wading pools, football and athletic fields. Detroit is spending $400,000 for similar work; and in Minneapolis the Park Department is using 1,600 CWA workers.

The CWA news from Massachusetts shows that in Fitchburg $16,000 has been provided for work on recreational projects; Framingham is using $20,000 for employment of relief labor in park and playground clearance and in improvement; and in Lynn the Park Department has had 700 workers employed on the Lynn Woods public golf course and the development of playground areas and road work.

In New Hampshire L. H. Weir, of the National Recreation Association, made a three-months survey of lakes, potential park areas and other recreational facilities. The matter of pollution was also considered. Governor Winant's desire for an agency which might carry out the recommendations of this survey is believed to have been a major reason for his prompt action in making New Hampshire the first state in the Union to appoint a State Planning Board under the regulations promulgated in December by the National Planning Board.

WEAVER W. PANGBURN,
National Recreation Association.

County Consolidation and the Cost of County Government

By J. THOMAS ASKEW
Department of History and Political Science,
University of Georgia,
Athens, Ga.

OF all governments, the county has undergone least change. With few exceptions it is the vehicle of four generations ago, when the oxcart sufficed for transportation. The apathy of the public has been so long continued that waste has grown to colossal proportions. A world-wide depression has at last disturbed the inactivity of the people, and in many states reorganization of some sort appears likely.

Recent developments in North Carolina and Virginia seem to point the way. Progress in science, changes in business methods, are continual, and the social aspirations of communities and regions are constantly undergoing change. This will force the county in the future to be a more adaptable political agency.

But there is no reason to believe that the county will not continue to be a vitally important unit of government and perhaps the most important in the life of the average man. Wherever wealth and numbers have been sufficient, more services have been demanded, until the once optional functions of the county are now of greatest importance, and in many cases require the services of highly paid technicians and scientists.

Many Inadequate Counties

The demands placed upon the county in this age of power and machinery make it clear that numerous small counties without sufficient taxable wealth cannot supply even the minimum demands of a better-informed and more widely traveled public. The result has been a sacrifice of modern necessities, or a terrific local tax rate. The taxpayer has not taken time to scrutinize county management carefully until in many cases indebtedness has reached a dangerous extent.

Poor roads, local competition among towns for trade areas, and the growth of community consciousness and pride, as population increased, led to the creation of counties the number of which is now out of all proportion to needs. Good roads and the automobile, larger social groupings, and larger trade areas, make it necessary for the political unit to be enlarged and made more flexible. If the county has rapid methods of communication and transportation, it does not need to be small in area. If it does not have these services, it should be connected to a wealthier district, so that they can be supplied.

There may be a more ideal way of rectifying some problems of local government than by consolidation and merging of counties, but it is the most practical because it can be easily understood and made appealing to the less fortunately located, and will raise fewer complications in solving divisions of debts. Perfect economic units, social groups, and geographical divisions cannot always be expected, but size will add strength, and to have fewer counties will simplify problems so that regional planning can be more easily undertaken. Consolidation will be found difficult enough.

The small area for convenience does not deserve the consideration it has been given in the past. Illinois recognizes this problem by requiring a minimum of 400 square miles for counties in the future. The average for the country is 975 square miles.

County Cost and Waste

From 1902 to 1913 the cost of general county government in the United States doubled, from 50 million to 102 million; and for all expenditures recorded, which include protection, charities, roads, schools, debt exemption, etc., from 491 million to 882 million. The average per capita cost for county government in 1913 was $4.49. In 1922, according to Prof. John A. Fairlie and Charles M. Kneier, the scale of county finances was about 2½ times that of 1913, and in 1927 it had increased by 50 per cent again. Of course there were increases in population, and services were widely expanded and improved, but there was also a large amount of wastage—how much we shall never know.

A part of this increase in cost can be attributed to an excessive number of counties, which require more distributing agents, and make checks more difficult and abuses more common. There must be a substantial reduction in number if costs are to be materially reduced. If one good jail suffices, it will not pay to support three poor ones, and the same can be said of court-houses, road machinery, the care of dependents, and health offices. Long-term criminals can be fed and housed cheaper by a large county. Office equipment can be reduced, assistants and deputies can take the place of once major county officials, and part-time officials can be reduced to a minimum. Modern machinery and equipment are better suited to governmental units of reasonable size. A small county cannot afford the more expensive road machinery, yet it frequently results in a saving to the taxpayer in the large county where the original cost can be met; and a better road is furnished.

The larger units of government are also essential to efficient state administration and rational division of functions between the state and county. To have fewer counties would simplify and reduce the cost of state and county operations, and the citizen could better understand his government. A balance should be struck between the county and the state that will encourage local initiative on the one hand and awaken state responsibilities on the other.

The consolidation in Tennessee in 1919 of James and Hamilton Counties, with Chattanooga as the county-seat, has been widely acclaimed by those favoring consolidations. Unfortunately, claims of savings in governmental cost have been broadcast that cannot be substantiated. There has been a saving of about 15 per cent, according to John W. Manning and Wylie Kilpatrick. Records were

confused by a state assessment law necessitating a change in the assessment of James County, soon after the consolidation, which about doubled the assessment and cut the rate in half. The big thing not to be overlooked is the great improvement in schools, highways and other county services.

Savings in the Administration of Large Counties

Recent research in Mississippi has determined that the large county is the least expensive in that state. Four small counties whose combined taxable wealth and population are approximately the same as those of Sunflower County spend four times as much for administration. Two other groups of three counties each spend a much greater amount for governmental costs and special functions than one large county with similar numbers.

An investigation in Ohio in 1932 revealed the fact that "in both the poor and the comfortably fixed counties the per capita cost of the standard elective offices rises sharply as population falls below 50,000." In Michigan the per capita cost is greater in small counties, according to Professor Bromage of the University. In Kentucky Professor Manning estimates a saving could be made of $3,000,000 by a radical reduction in the number of counties. The Oklahoma Chamber of Commerce estimates a saving of $17,000,000 by reducing the number from 77 to 20. A Texas estimate calculates a $7,000,000 saving if the 254 counties are reduced to 50, and also allows for a reduction in taxes. The Attorney-General of Missouri believes a saving of $4,500,000 possible if the 114 counties are reduced to 40. Some of these estimates are very likely too large, but some sort of saving by this method cannot be gainsaid.

Oklahoma requires a county to have a minimum of $2,500,000 in taxable wealth. Modern wants added to modern improvements in transportation make numbers and wealth more important than area. It would be difficult to justify the existence of a county with less than 20,000 or 25,000 people, a county-seat of 2,000 or 3,000, and taxable wealth of 4 or 5 million dollars; and to have adequate services it must be far above this minimum. In California, with over 5½ million population and only 58 counties, the Taxpayers Association is agitating consolidation. J. A. H. Kerr estimates a saving of $30,000,000 by reducing the number by half. He also suggests a minimum population of 50,000. In Kansas a business man estimates a saving of 60 per cent by a radical reduction in counties and a minimum of 50,000 population. Such a restriction might be inadvisable in parts of the South where the county is of more social consequence and more of a small community arrangement, but a minimum of 25,000 or 30,000 would be a practical goal.

Reduced Taxes and Inefficient Administration

Governmental cost is a most vital problem. In 1913 governments took 9 per cent (3 billions) of total incomes and earnings, and 15 per cent (10¼ billions) in 1931. This has been especially burdensome in the rural sections where incomes have been greatly depleted. Criticism of per capita cost, however, should be tempered by some considerations of efficiency of administration and the kinds and quality of services performed. The assumption that the taxpayer will always save money from tax reductions is erroneous. A needed service which can be more cheaply performed by the county is a saving in dollars and cents to the community. Closing schoolhouses and allowing the needy to starve is a great financial loss. Local officialdom in small counties can quite frequently point to a lower tax rate and lower bonded indebtedness than more progressive counties. Fees paid to officers are not known or considered, and efficiency of administration is assumed to be less important than tax rates. Of course taxes should be lowered on real estate improvements and personal property, but the ratio between taxes paid and services performed deserves more attention.

One big advantage in county consolidation is the equalization of the tax burden in sections with an uneven distribution of wealth. It is not just to the city to separate it politically from the surrounding trade and population area. The country builds the city, and the country needs the city when the taxes are to be paid. Road construction, educational opportunities, and social and health work can be developed properly in the rural rim around the city only in case the city helps to equalize the tax burden. If in the same political division, county consciousness is apt to make the rural and urban groups more interested in improving the financial and social well-being of each other.

Consolidation of County Functions as a Remedy

Consolidation of certain county functions will be the answer to specific problems, though less satisfactory than outright consolidation accompanied by flexible forms of government. Virginia is successfully demonstrating the advantages of county cooperation in the three fields of health, public welfare and education. About one-half the almshouses have been abolished. In 23 counties a survey showed a per capita cost to be $33 a month. Consolidation into four districts has split the cost in half in five years, and the total investment has not been increased; and, more important, many inhumane practices have been abolished. There are 17 other states which recognize the weakness of the small county by providing functional cooperation between adjoining counties.

City-county consolidations and city-county separations have been more frequent, as have the consolidations of certain functions of counties. Baltimore, 1851, Philadelphia, 1854, San Francisco, 1856, St. Louis, 1875, and Denver, 1902, are examples of the former, and although serious complications have arisen in St. Louis, all have been financially beneficial.

There are many strong and honest doubts as well as practical objections to county reforms, but the main source of trouble lies elsewhere. Local officialdom, their families and friends, will be able to hold counties apart for some time to come. Repeated demonstrations of financial gains will be the strongest arguments against this unwholesome power.

County consolidation is one of the most attractive methods yet suggested for settling a great many local problems. Even if no great amount of money, in actual dollars and cents, is saved, at least the amount now going to up-keep in the form of officers' salaries and other purely governmental costs will go to better roads and schools, and better health and welfare services for the community. The citizen is faced with a great financial responsibility in reorganizing county government, because it is the county that now admittedly spends and wastes more than either city, state or nation.

Per Capita Costs and Tax Collections

OWING to the diversion of its staff to emergency problems, the Bureau of the Census has not yet completed for publication its financial statistics of city governments for the year 1932, which otherwise would now be in print. To make available, however, some of the most significant of the figures already compiled, THE AMERICAN CITY has prepared from the releases issued for individual cities the following tabulation.

The first three columns of figures show the per capita payments for operation and maintenance of the general departments of the respective city governments, whether made from current revenues or from the proceeds of bond issues. The figures do not include, however, payments for the operation and maintenance of public service enterprises (ordinarily self-sustaining) or interest on debt or outlays for permanent improvements.

The last three columns show the per capita property taxes collected in each of the three years.

The list contains all cities in the United States having, according to the 1930 census, a population of over 100,000.

	Per Capita Payments General Departments			Per Capita Property Taxes Collected		
	1930	1931	1932	1930	1931	1932
Akron, Ohio	$29.90	$29.32	$23.93	$38.02	$35.04	$26.08
Albany, N. Y.	43.84	44.59	45.93	54.72	57.73	52.53
Atlanta, Ga.	30.08	30.24	26.60	22.78	21.12	19.22
Baltimore, Md.	40.37	40.66	42.72	39.41	40.25	37.64
Birmingham, Ala.	22.78	21.16	18.45	16.60	15.33	14.38
Boston, Mass.	73.53	77.32	81.19	80.15	77.06	73.71
Bridgeport, Conn.	42.45	48.79	51.10	51.94	52.49	51.75
Buffalo, N. Y.	62.83	65.27	67.77	64.74	64.11	61.97
Cambridge, Mass.	53.87	53.86	58.21	54.03	58.87	57.73
Camden, N. J.	42.78	45.16	39.64	33.81	31.06	33.94
Canton, Ohio	29.37	29.88	23.76	37.67	33.74	26.02
Chattanooga, Tenn	22.37	23.14	21.65	19.92	20.51	18.06
Chicago, Ill.	43.12	43.12	*	27.81	51.25	*
Cincinnati, Ohio	50.03	52.38	51.36	51.31	52.47	44.24
Cleveland, Ohio	48.68	48.58	44.68	57.44	53.99	45.35
Columbus, Ohio	30.11	29.69	28.45	36.83	32.26	26.35
Dallas, Texas	26.98	27.28	*	26.58	26.16	*
Dayton, Ohio	30.92	31.86	27.94	36.62	36.72	29.69
Denver, Colo.	46.03	45.01	44.21	44.72	44.17	42.01
Des Moines, Iowa	34.52	34.62	32.76	40.93	40.64	38.59
Detroit, Mich.	55.39	59.74	42.51	54.91	56.80	43.89
Duluth, Minn.	39.18	38.52	*	46.92	43.81	*
Elizabeth, N. J.	36.77	38.42	*	30.86	31.18	*
El Paso, Texas	23.51	24.88	23.91	22.18	21.79	20.10
Evansville, Ind.	24.76	24.78	23.40	71.16	28.99	25.61
Erie, Pa.	28.84	28.90	27.06	32.94	32.21	31.17
Fall River, Mass.	43.73	36.33	37.16	36.92	40.34	40.59
Flint, Mich.	36.77	35.41	31.69	39.11	39.35	31.57
Fort Wayne, Ind.	28.78	28.62	*	30.02	30.21	*
Fort Worth, Texas	26.09	26.00	24.16	28.40	27.98	25.91
Gary, Ind.	34.17	34.17	*	40.55	31.39	*
Grand Rapids, Mich.	35.99	38.04	41.94	45.45	39.78	34.96
Hartford, Conn.	51.64	57.32	60.49	60.54	64.55	63.69
Houston, Texas	25.73	29.41	*	33.85	31.25	*
Indianapolis, Ind.	39.64	33.80	35.69	47.07	45.43	41.99
Jacksonville, Fla.	31.91	33.27	*	27.57	27.14	*
Jersey City, N. J.	66.15	72.27	72.32	61.24	61.83	59.98
Kansas City, Kans.	24.17	24.01	*	34.11	30.60	*
Kansas City, Mo.	43.11	42.23	40.30	41.64	40.95	38.70
Knoxville, Tenn.	27.44	28.09	22.85	30.14	24.44	26.86
Long Beach, Calif.	47.48	44.49	40.59	40.43	39.90	36.89
Los Angeles, Calif.	62.38	62.14	57.66	68.52	63.22	57.83
Louisville, Ky.	35.65	36.90	*	39.31	36.84	*
Lowell, Mass.	41.33	41.33	39.77	42.30	38.47	36.10
Lynn, Mass.	39.90	44.54	45.80	39.00	39.25	41.25
Memphis, Tenn.	23.65	23.48	21.95	25.09	23.01	21.37
Miami, Fla.	34.39	29.80	29.93	41.85	40.45	31.55
Milwaukee, Wis.	53.21	55.19	*	53.92	53.52	*
Minneapolis, Minn.	43.06	44.95	*	48.57	48.35	*
Nashville, Tenn.	23.52	23.34	22.84	25.22	23.35	22.24
Newark, N. J.	70.88	71.24	73.48	67.23	63.98	61.49
New Bedford, Mass.	45.40	43.82	41.96	48.76	45.59	45.49
New Haven, Conn.	46.25	48.38	*	47.24	48.17	*
New Orleans, La.	27.90	30.35	28.68	34.69	32.36	24.54
New York, N. Y.	60.64	65.48	*	69.00	68.08	*
Norfolk, Va.	33.75	33.47	*	38.30	37.91	*
Oakland, Calif.	39.31	39.14	*	39.82	38.64	*
Oklahoma City, Okla.	19.68	22.97	23.74	34.97	26.67	17.34
Omaha, Nebr.	31.17	32.88	*	38.81	40.40	*
Paterson, N. J.	45.38	49.55	49.50	45.55	41.45	41.75
Peoria, Ill.	25.01	24.90	24.49	30.15	31.67	24.23
Philadelphia, Pa.	45.95	47.67	40.66	48.76	47.93	46.63
Pittsburgh, Pa.	57.95	59.16	51.63	69.35	67.79	59.07
Portland, Ore.	39.91	45.02	41.95	48.95	48.30	43.14
Providence, R. I.	43.26	44.48	49.33	48.24	48.59	50.24
Reading, Pa.	30.50	30.79	30.19	32.33	32.41	30.64
Richmond, Va.	32.68	33.41	33.23	34.02	32.80	31.87
Rochester, N. Y.	65.61	74.22	73.33	60.45	58.44	58.80
St. Louis, Mo.	40.43	42.08	41.66	40.27	41.65	40.01
St. Paul, Minn.	30.40	30.48	*	34.06	33.55	*
Salt Lake City, Utah	28.67	30.31	28.18	29.49	26.87	21.87
San Antonio, Utah	24.92	27.61	19.68	28.99	28.14	23.82
San Diego, Calif.	37.61	36.33	35.73	34.88	38.14	28.00
San Francisco, Calif.	46.22	47.00	48.16	50.85	50.93	48.03
Scranton, Pa.	34.77	35.51	36.50	32.11	35.33	32.84
Seattle, Wash.	48.66	50.78	52.49	54.79	52.32	43.87
Somerville, Mass.	36.45	39.15	43.63	33.09	33.05	36.86
South Bend, Ind.	28.75	27.30	26.90	33.55	29.76	30.01
Spokane, Wash.	31.95	32.07	30.12	27.00	24.74	21.58
Springfield, Mass.	54.63	60.49	63.36	57.97	56.42	53.63
Syracuse, N. Y.	48.11	51.00	*	47.30	42.88	*
Tacoma, Wash.	32.73	32.75	30.45	26.44	21.96	18.80
Tampa, Fla.	31.78	29.47	28.36	35.99	32.07	27.06
Toledo, Ohio	38.20	40.89	35.53	42.33	37.41	28.55
Trenton, N. J.	46.21	47.81	*	42.63	39.01	*
Tulsa, Okla.	27.45	28.76	28.19	46.33	29.46	40.72
Utica, N. Y.	43.25	44.29	42.15	43.65	42.56	40.52
Washington, D. C.	62.94	66.85	*	50.79	51.91	*
Waterbury, Conn.	43.22	45.32	*	68.24	55.77	*
Wichita, Kans.	29.19	28.20	25.01	33.85	30.92	26.84
Wilmington, Del.	29.60	30.75	30.84	24.51	24.24	24.60
Worcester, Mass.	52.98	59.57	59.69	49.96	52.68	47.75
Yonkers, N. Y.	65.09	67.44	*	67.64	67.13	*
Youngstown, Ohio	32.37	28.59	30.87	39.29	34.36	25.60

*Figures not yet available.

Conference on New Planning Opportunities in Illinois

BELIEVING that many municipalities and other administrative units of the state of Illinois are without adequate planning superivsion and direction, and that this need is particularly emphasized at the present time when large sums of money are being expended upon public works from funds set up through Federal or state agencies, Dean Rexford Newcomb of the College of Fine and Applied Arts of the University of Illinois called a one-day state-wide conference of city mayors, village presidents, city planning officials, members of planning and zoning commissions and other interested citizens at the University at Urbana on January 10, 1934.

This conference was attended by 150 officials from over the state and a considerable number of interested citizens. Dean Newcomb in extending a word of welcome to the morning session stressed the broad foundations and ideals of planning. He believed that there was no question but that we are entering an era that will be characterized by planning. "The world of tomorrow," said the Dean, "will be a planned world." He sketched the changing attitude toward planning, contrasting the "city beautiful" ideals of a few years ago with present planning concepts. The Dean showed how "in America we are now in need of an adequate national master plan, matured state plans, regional plans within states, covering one

of several counties, county plans, regional plans focalized about towns and cities, and town and city plans with their zoning, commercial, industrial and recreational implications."

Dean Newcomb emphasized the fact that plans could not be merely *geographical* or *physical*, but that they "should comprehend historical, geographical, economic, governmental, sociological and other background considerations, attention to which is necessary to any adequate planning program."

As Chairman of the newly appointed State Planning Commission, Robert Kingery, Acting Director of Public Works, discussed a ten-point planning program in setting forth "What a State Plan Should Do for Illinois." This program includes preparation of a general zoning plan for the land of Illinois, investigation of present agricultural trends, examination and study of state park sites and monuments; also the development of a complete and long-term policy as to forests, fish and game preserves, and conservation works; a study of the state's streams in preparation for water control and stream sanitation; the elimination of pollutions in rivers; road studies and building; study of military reservations from the zoning angle; planning for land use by public welfare institutions; and the completion of the geological survey of the state.

Other speakers included Jacob Crane, recently appointed Consultant for the new Illinois State Planning Commission; Harland Bartholomew, city planner, of St. Louis, Mo.; Mayor Thomas Butler, of Alton, Ill.; and Karl B. Lohmann, Professor of Landscape Architecture, University of Illinois.

The session closed with a talk by William E. O'Brien, Director of the Wisconsin State Highway Commission and formerly City Manager of Kenosha, Wis. He told "How One City Makes Use of Its City Plan" and gave a remarkable story of reduced taxes over a period of years that saw important physical accomplishments in Kenosha. He cited particularly the work that has been done in the parks, streets, grade crossings and transportation, and work in connection with the civic center.

Concrete Paving in Winter

High Early Strength Cement Makes Possible Rapid Progress on December Paving Job in Indianapolis

INCLUDED in the late fall and early winter construction program of Indianapolis, undertaken to provide as continuous employment as possible during this hitherto inactive period, was a four-block concrete resurfacing project which was let and completed in December and which ordinarily would probably not have been ordered until spring. This section on Ohio Street was originally paved with wood block on a concrete base. The wood block was stripped from the base, and a new surface of reinforced concrete was laid to a minimum depth of 5 inches, but averaging 6 inches. Before the surface was laid a sand cushion was placed on the base.

The length of the resurfacing is 1,200 feet, and the width 27 feet. It was reinforced with 67-pound mesh. No mix was specified, but the concrete was required to develop 3,500 pounds compressive strength in 28 days. The city's requirement for standard concrete paving, 7-inch thick, is 4,000 pounds in 28 days.

The first resurface concrete was placed December 16, and the last December 24. The contractor's bid price for the work was $5.10 a lineal foot using regular cement, and $5.51 a lineal foot using high early strength cement. The square yard equivalents of these prices are $1.70 and $1.87 respectively. Having in mind, however, the lateness of the season, and with the view of reducing to a minimum the hazards of cold weather, the city decided in favor of the latter bid.

Previous Experience

Indianapolis had previously used high early strength cement for paving work, but only in intersections, so that this is the first complete paving job of the city in which this cement has been used. Consequently the work was watched very closely by the Engineering Department. Frequent samples of the concrete were taken for test as it was deposited on the grade, and numerous thermometer readings were obtained to assure that its temperature did not drop below a safe point.

Air temperatures were normal for this season of the year except for a few days when the thermometer failed to rise above 40 degrees, and the minimum night temperature was 17 degrees. Low temperatures affected the strength of the concrete but little. Tests revealed an average three-day strength of 3,800 pounds and an average seven-day strength of 4,800 pounds. The opening requirement for the pavement was 2,000 pounds. Also, the minimum day temperature recorded for the surface of any of the slabs under their burlap and straw covering was 54 degrees.

EAST OHIO STREET, INDIANAPOLIS
RESURFACING OF OLD WOOD BLOCK PAVEMENT
Length, 1,200 ft. Width, 27 ft. Av. Thickness, 6 in.

TESTS BY CITY ENGINEERING LABORATORY

Test of Concrete Placed		Temperature		Compressive Strength Lbs. per Sq. In.			
Date	Hour	Concrete	Air	1 d.	2 d.	3 d.	7 d.
12/15/33	9:30 A.M.	70°	66°	....	....	4,040	5,020
"	3:00 P.M.	67°	66°	....	....	3,820	4,740
12/16/33	10:00 A.M.	64°	39°	....	....	3,600	....
12/18/33	9:40 A.M.	64°	38°	1,260	1,460	....	....

Thermometer on slab under straw covering Dec. 20 and 21 registered min. of 54° with 42° minimum outside air temperature these two days.

Concrete 18 hrs. to 3 days old.

Pre-mixed concrete was used on the work, being delivered in transit-agitated trucks from a commercial plant about 4½ miles distant from job. The mixing water and aggregates for the concrete were heated and, despite the long haul, registered a temperature of from 64 to 70 degrees when deposited.

A cut was made for a sewer trench over the entire length of the project to permit of relaying the pipe. The trench was backfilled very carefully, and then protected from the weather with straw pending replacement of the concrete. Before the concrete was poured the straw was burned off to thaw out any frost that had accumulated in the fill in the meantime.

Fifteen men were directly employed on the paving work. In addition there were five men engaged at the plant supplying the ready-mixed concrete for the job, and eight truck drivers delivering the concrete. The sewer work, which was done by the city's own forces, gave employment to another 30 to 50 men, working a total of 4,856 man-hours. This crew was made up wholly of relief labor.

The contractor on the paving was R. M. Bowen, of Indianapolis.

Construction and Cost of Standard Penetration Macadam Roadway in Massachusetts

By RAYMOND W. COBURN
Construction Engineer, Massachusetts Department of Public Works, Boston, Mass.

THE materials necessary for the construction of a good bituminous macadam road are, first, a good hard and tough stone, and, second, a good grade of bituminous material, either asphalt or tar of the proper consistency. The stone for the penetrated top should preferably be a good commercial trap rock or an equivalent local stone, having a French coefficient of wear of not less than 14 and a toughness of not less than 12. Where the work is to be done on a secondary road, however, and a local stone of 12 and 10 is available at a lower cost, it can be safely used with satisfactory results. The base course stone can be of an inferior quality, 10 and 8 being the usual specification, but 8 and 8 would be satisfactory on secondary roads.

The Standard

The penetration macadam or bituminous macadam pavement of the standard type now used in Massachusetts was developed in 1912, and consists of a 2- to 3-inch top or wearing surface of 2½-inch stone, penetrated with heavy asphalt or tar. This top surface is usually laid on a prepared foundation consisting of bank gravel and a base course of broken stone, but in many places, especially in resurfacing work or on a secondary road, it is possible to omit the macadam base course and lay the 2½-inch bituminous macadam surface directly on top of an old macadam road or gravel foundation.

The bituminous material may be any one of three kinds which shall have certain specified properties, and among other requirements, must meet the following:

A—Fluxed native lake asphalts shall have a penetration of 120 to 150.

B—Oil asphalts shall have a penetration of 85 to 120.

C—Tars shall have a consistency of 120 to 180 by the float test.

The amount of machinery and equipment necessary for the construction of a penetration macadam road is probably smaller than for any other type of modern equipment. For that reason it is popular in cities and towns where they want to do the work themselves and where they do not own expensive machinery. Provided the stone is trucked to the job and the bituminous material is sent out from a heating plant in a truck sprayer or distributor, about the only machinery needed on the job is the steam roller.

The inspection in the field is a most important phase of this work, and it is believed that more penetration roads fail because of poor workmanship and poor inspection than from faulty materials. A bituminous macadam road may fail from poor design, because foundations and drainage were omitted where they were needed; or it may fail because of poor quality of bitumen, or because work was done when weather conditions were unsatisfactory; or it may be caused by too little or too much bitumen; but it is believed that the majority of the failures could be prevented if the inspectors were properly trained in the details of the work. Any man who wants to be successful on this kind of work should leave off his white collar and good clothes. The work is dirty, and no man can see what is going on unless he is willing to dress so that he can get into the midst of it.

Method of Construction

The first step in the construction of the penetration road is the provision for adequate drainage. In loamy or clayey soils, a subgrade of granular material (bank-run gravel) should be laid, or a stone base on top of about 4 inches of sandy gravel. In wet and springy ground, side drains should be built or ditches should be provided along the sides of the road in order to keep the ground water out of the subgrade. Elimination of water in the subgrade is very important, and unless bleeders of porous material are built at regular intervals to carry the water out from under the pavement, the subgrade may become saturated and lose its normal bearing power, and in cold weather cause heaving or frost action. The bleeders are especially important at low points in the profile, and here they should be built on both sides of the road to make certain that there is no ponding of water under the pavement. Having drained the road and provided suitable subgrade and shoulders, the next step is to roll the subgrade thoroughly with a heavy roller until no settlement can be discerned.

Base Course.—Upon this compact subgrade there is spread a layer of broken stone, preferably No. 1 stone, but if it is necessary to use the output of a crusher, then the No. 1 and No. 2 stone may be mixed, care being taken that they are mixed uniformly and that there is not an excess of the No. 2 stone. This layer should be carefully spread either from self-spreading trucks or with stone

spreaders, and after rolling should have a perfect cross-section 2 to 2½ inches below the desired finished grade. Up to this point no dust or sand binder should have been added, for it is very important to get the maximum amount of mechanical bond before adding the binder or filler, and it is only when the roller will no longer leave its marks on the surface of the broken stone that the stone can be considered thoroughly rolled. In spreading the binder, it should be put on in two or three applications, while the roller is working, and in no case should it be dumped on the surface of the broken stone. During the rolling of the base course it is quite important to roll out on the shoulders for 12 to 18 inches in order to insure a strong, compact shoulder that will not weaken or settle when the final rolling is being done on the finished surface. After the base course has been bound up with the binder and rolled until it is thoroughly compacted, it should resemble somewhat a water-bound macadam surface, except that it is not bound up so tightly. The surplus binder is then broomed from the surface, and the top wearing course can be spread.

Top Course.—The best results will be obtained in the top course if No. 1 trap rock is used, being careful that there is no No. 2 or finer stone mixed with it. This trap rock should be spread with a mechanical spreader, or from dumping boards with forks, and the dust, dirt and small stone left on the boards thrown to one side and wasted. This is important, for with almost every truckload of broken stone there is a bushel or more of dirt and small stones, and if this is left in the road in one spot, as is likely, proper penetration will not be obtained when the bitumen is applied, since the voids will be partly filled with dirt. Furthermore, there would probably be a blot or "fat place" on the surface where the bitumen could not penetrate. The top stone carefully having been spread, and all the patching done that can be seen at the time, the top surface should be lightly and carefully rolled and the patching continued until the road surface looks absolutely perfect. The patching should be done with No. 1 stone only, and it is important to do it before the surface is rolled too much, for it is very hard to roll a patch into a well-rolled road. The top course is usually 2½ inches thick. When the stone is so rolled that the roller does not make a track on the stone, but before the stone begins to break up under the roller, the top course is ready for the bituminous material.

Penetration.—The engineer in charge of the bituminous work should now carefully inspect every square foot of the surface where he intends to apply the asphalt, to see that there are no depressions and that the stone is clean and of the proper depth. Special care should be taken to see that the edges of the road are straight and neat, and that dirt from the shoulders has not been allowed to enter the top stone, for if the edges are neglected, they will be the first to ravel. He should then see that the bituminous material is of the proper temperature and that all the nozzles of the sprayer are absolutely clean. The details having been looked after, word may be given to go ahead and apply the bitumen. If asphalt is used, it should be heated to a temperature of about 350 degrees and applied under a pressure of 60 pounds per square inch, at a rate of 2 gallons per square yard, either with a motor-distributor or with a wagon sprayer, but not with a single nozzle. If the distributor streaks and does not apply the asphalt uniformly, it should be stopped at once, and removed from the top stone while the nozzles are being cleaned, or a trough should be put under the nozzles while they are dripping and being cleaned.

After the load has been distributed on the road, and before the asphalt is covered with pea-stone, the engineer should carefully examine the surface to make sure that there are no white streaks or spots that have been missed. If any are found, they should be carefully patched with a pouring can. The surface having been examined and found O.K., the asphalt and the surface should be rolled while warm. The application of pea-stone should be so light that the roller at all times will be bearing on the No. 1 stone and not on a cushion of pea-stone. If the wheels of the roller stick to the asphalt, as they probably will in warm weather, they should be oiled. More pea-stone should be added as the rolling takes place, until the surface has an even texture, with the voids mostly filled, but with no loose or surplus pea-stone on the surface. When the first application of asphalt has been covered with the proper amount of pea-stone, and the surface has been thoroughly rolled, it should be swept clean of all surplus pea-stone and the seal coat applied.

The seal coat should be applied at a rate of not over ½-gallon per square yard. It is even more important than with the penetration work that the asphalt be hot and the nozzles clean, for the distributor is moving about four times as fast while applying the seal coat. Tar paper or building paper should be spread down on the road and covered with sand, at the point where the distributor is to be opened up, and the distributor should start far enough back from the point where it is proposed to begin spraying so that it will have a flying start and be going at the proper speed when the nozzles are opened. After the load has been applied, the asphalt which landed on the paper is wrapped up and thrown to one side, and if the work has been properly executed, there will be a straight-line joint where the seal coat started, without a surplus of asphalt on the portion already sealed, and the surface will not have a blot or fat spot on it. A fat spot is a defect in the road. They may be caused by dirty stone, small stone, or stone spread too thin, or overlapping either at the center joint or at the beginning or end of a load, all of which can and should be avoided in order to get perfect results.

The seal coat is now covered with ½-inch pea-stone, using about the same method as outlined above for the penetration course; that is, being careful not to put too much on at any one time, keeping it free from bunches, and keeping the roller going while the seal coat is still warm. This final covering of pea-stone should consist of just a little more than will stick to the road; it should be broomed about uniformly, and thoroughly and carefully rolled, this final rolling being very important, for there is then no danger of breaking the No. 1 stone. A 12- to 15-ton roller is better than the 10-ton roller for this final work. After applying both the penetration work and the seal coat, the bituminous material that overlaps on the shoulders should be trimmed off to the line of the edges of the broken stone, in order to get a good, clean-looking line along the edges of the road.

The above refers to asphalt penetration, for it is believed that the asphalt penetration is, in most places, superior to the tar. However, they are both used in bituminous macadam roads, and the same methods for carrying on the work should be used with either material. As-

phalt probably has a longer life than tar, and if properly used will require less maintenance. Tars, however, may be used with certain local stones where the travel is not too heavy, or in cold weather, with more success than asphalt, for tar will work its way into smaller voids than asphalt, and works down into the road with travel and hot weather, while asphalt works both upward and downward.

In the northern states the season of the year in which the work is done is very important. Perfect results cannot be obtained on work done after the first of October. Work finished previous to August 1 or September 1 is usually much better than work done later in the season. The reason for this is that work done in the early summer gets the benefit of being rolled during the hot weather, and the travel and sun help to bond the stone and the asphalt.

Bituminous macadam has been used extensively and successfully to resurface the old water-bound macadam roads, and in this field it can be most economically used, for in many places the old macadam surface will furnish the necessary base for a new 2-inch wearing surface. When the road is built in this way, care should be taken to locate the spots in the old road that show any signs of weakness in the spring or break with the frost, and they should be strengthened either by adding base stone, or by subgrading.

Mileage and Cost of Work

On the state highway system of Massachusetts there are today 922 miles of penetration roads, most of which are asphalt macadam. This mileage totals more than all other types combined, and during the last few years more than half of all the work supervised by the Department of Public Works has been of this type.

Bituminous macadam has been used almost exclusively on the more important state-aid roads, as well as on the main state highway routes, where trucking is not of major importance. The construction cost for this type has varied all the way from $8,000 to $35,000 per mile, depending upon whether the project was resurfacing or new, heavy construction, and depending further on the amount of grading and drainage, the width and depth of the pavement, the location of the project, and the year in which it was built.

An experimental project of bituminous macadam was built in 1913 between Lowell and Lawrence, Mass. It is 18 feet wide, and about 3¼ miles in length was subgraded with from 6 to 12 inches of gravel, and the wearing surface, 2 inches in thickness, was laid on a 4-inch macadam base and supported by 3-foot gravel shoulders 6 inches in depth. Six sections, approximately each ½-mile in length, were built of asphalt, using five different kinds of oil and one native asphalt, making a total of 3 miles of asphalt macadam. The remainder, about ¼-mile, was penetrated and sealed with tar. The actual cost of this road when built, including all grading and drainage, was about $25,000 per mile, but, excluding the drainage and the excavation other than that necessary for a 9-inch gravel subgrade, the cost would have been about $16,000 per mile. Using 1932 average contract prices, this $16,000 per mile would be reduced to about $9,500 per mile.

This road has been under maintenance for nineteen years and at present is carrying more than 7,000 vehicles per day, 10 per cent of which are trucks. At no time have any of the asphalt sections been given a surface treatment,

THE COST OF BUILDING A PENETRATION MACADAM ROAD AT 1932 AVERAGE CONTRACT PRICES

(Not including drainage—and assuming the new grade to be 6 inches above the old surface)

Width of surface	18 feet			
Type of surface	2½-inch macadam			
Bituminous material	Asphalt, 2⅜ gals. per sq. yd.			
Foundation	10 inches of gravel			
Shoulders	Gravel, 3 feet by 6 inches			
				Per Mile
Excavation	1,906 c.y.	at $0.20	=	$381.20
Gravel borrow	4,224 c.y.	at .28	=	1,182.72
Broken stone	1,544 tons	at 1.66	=	2,563.04
Asphalt	25,080 gals.	at .07	=	1,755.60
Fine grading	14,080 s.y.	at .01	=	140.80
				$6,023.36

Width of surface	18 feet			
Type of surface	2½-inch macadam			
Bituminous material	Asphalt, 2¾ gals. per sq. yd.			
Foundation	8-in. stone fill over 3 ins. of gravel			
Shoulders	Gravel, 3 feet by 6 inches			
				Per Mile
Excavation	2,200 c.y.	at $0.20	=	$440.00
Gravel borrow	2,347 c.y.	at .28	=	657.16
Broken stone	1,544 tons	at 1.66	=	2,563.04
Asphalt	25,080 gals.	at .07	=	1,755.60
Fine grading	14,080 s.y.	at .01	=	140.80
Stone fill	2,347 c.y.	at 1.30	=	3,051.10
				$8,607.70

and only $160 per mile was spent on the surface of this road last year. The average cost per mile per year since the road was built was less than $64.

A second typical project is that on Blue Hill Avenue in Milton on the main automobile and trucking route from Boston to Taunton, Fall River and New Bedford. In 1924, 3½ miles of 2½-inch asphalt macadam was built on top of a foundation consisting of 3½ inches of broken stone and 6 to 12 inches of bank gravel. The surface was 24 feet wide, but the outer 2 feet on each side had no gravel foundation as this extra width was added as an afterthought, to provide hardened shoulders. The actual cost of construction is not available, but, assuming an average 9 inches of excavation backfilled with a 9-inch gravel foundation, this 2½-inch penetration on top of a 3½-inch macadam base would cost today, for a 24-foot width, including foundation for full width, about $12,500 per mile, which would be equivalent to $9,500 per mile for an 18-foot width. The road is now carrying about 12,000 vehicles per day, 10 per cent of them being trucks. The cost of surface maintenance, both for the year 1931 and for the average of its eight years of life, has been less than 1 cent per square yard, the actual figures being $170 per mile.

Another typical project is the old Boston Post Road, built with a stone fill foundation in the town of Spencer. In 1921, 3 miles of asphalt macadam were built, the design calling for a 2½-inch penetration on top of a base course of 2 inches of broken stone over a 10-inch stone fill and 4 inches of sandy gravel. The original cost of the project is not available, but, assuming 12 inches of excavation for a 20-foot width backfilled with the 4-inch gravel subbase and the 10-inch stonefill, and surfaced with the two layers of broken stone, the top layer being penetrated with asphalt, and supported with gravel shoulders 3 feet wide and 6 inches deep, this road at 1932 average contract prices would cost about $13,000 per mile for a 20-foot width, equivalent to $11,600 per mile for an 18-foot width. This road, now under maintenance for eleven years, is at present carrying a traffic of about 6,000 vehicles per day, with a surface maintenance cost for the year 1931 of ½-cent per square yard, and with an average cost per square yard per year of 0.6-cent.

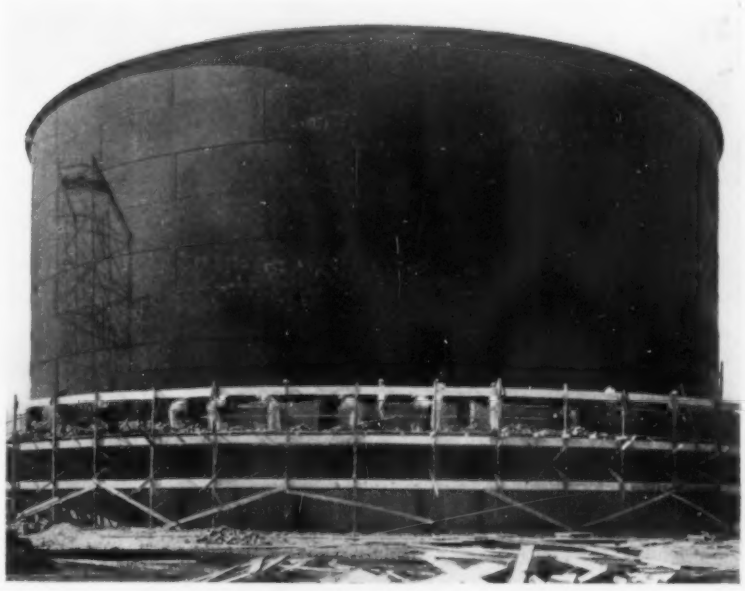
The fourth typical project was built in 1913 in the town of Methuen with a 2½-inch top macadam top, 18 feet

wide, placed directly on top of an old gravel road. The cost of this construction was about $8,000 a mile, more than half of the value representing the cost of the tar in the road. The cost of doing the same work today, using asphalt instead of tar, would be slightly less than $5,000 per mile. The road has been under maintenance for 19 years, and is carrying more than 7,000 vehicles per day. The maintenance figures show that over the entire nineteen years the average cost per mile per year has been $250, but for the last two years it has averaged only $50 per mile. The reason for this paradox is that this tar macadam has been given several surface treatments, the last of which was in 1928, and these have caused the average cost per mile since built to be high, but has caused the cost per mile for the year or two following the treatment to be low.

ACKNOWLEDGMENT.—From a paper presented before the Association of Highway Officials of the North Atlantic States.

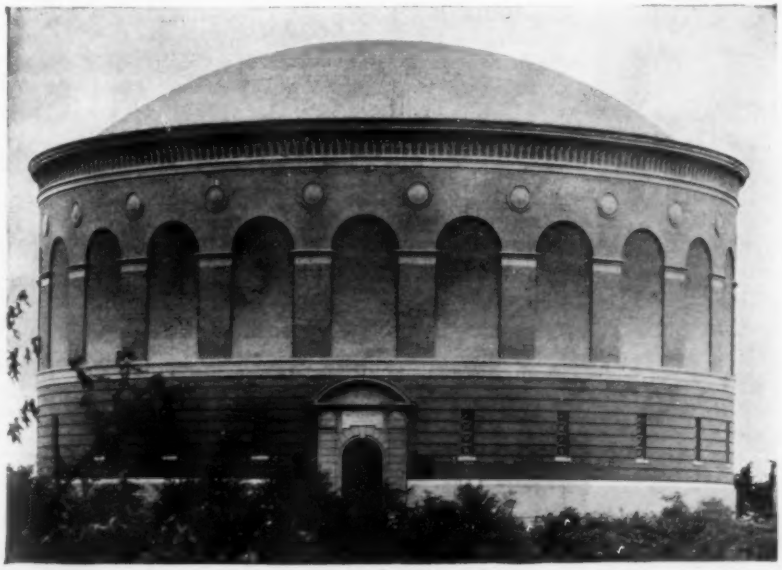
An Ornamental Enclosure for a Steel Water Tank

The Three-Year-Old 4,000,000-Gallon Tank in Baltimore Is Now Clothed with an Attractive Brick Wall



WHEN THE BRICK ENCLOSURE WAS STARTED

IN 1930 the Bureau of Water Supply of the city of Baltimore, Md., built a steel water tank with a capacity of 4,000,000 gallons to serve the Curtis Bay District. Its primary purpose was to raise the hydraulic gradient during periods of heavy draught. Also, it provides a 12-hour reserve water supply in case of interruption of the supply from the 30-inch main leading to that district. This main is laid through a waterfront section crossing over several mud flats and has at different times displayed a tendency to settle, a condition creating a rather constant menace to dependable service.



BRICK STRUCTURE NOW ENCLOSING THE TANK

Baltimore has one of the outstanding water-works systems in the country. All the buildings at the central plant are of brick, far above the average in attractive architectural design and beauty. Constant criticism of the appearance of the large steel tank on the landscape in the Curtis Bay District led the city officials to determine to beautify it in some manner. J. H. Strohmeyer, Engineer of Water Distribution, was in charge of providing plans for some type of enclosure which would be artistic and yet possible of construction at moderate cost. He secured the collaboration of Frank O. Heyder, architect for the Bureau of

Planning and Surveys, and an engineer of the Baltimore District Office of the Common Brick Manufacturers Association, who submitted data on reinforced brick masonry, which was finally adopted for the enclosure.

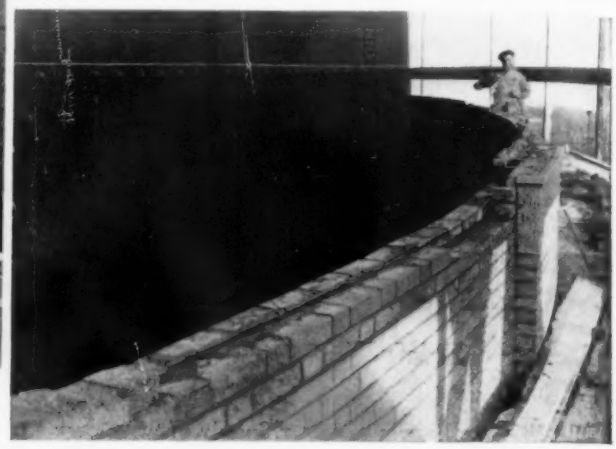
The steel water tank, work on which was started by the Chicago Bridge & Iron Works on June 10, 1930, and completed November 19, 1930, is one of the largest in the world. It is 110 feet in diameter and 60 feet high from the base to the top of the plate section. Above this rises the roof, a spherical dome, to an additional height of 20 feet. The adopted design for the beautification of the tank provided for a circular reinforced brick wall 119 feet in

THE LOWER 17-INCH WALL WAS REINFORCED WITH TWO ¼-INCH STEEL RODS

THE 9-INCH RECESSED PANEL WALLS CARRIED ONLY ONE STEEL ROD

outside diameter, completely enclosing the tank and leaving a clear space of 2½ feet between the wall and the steel shell of the tank. The wall varies in thickness from 17 inches at the base to 13 inches in the courses above the pilasters on which the series of arches are built. The entire wall is reinforced from the concrete base to the last few upper courses. Two ¼-inch steel rods were used in every eighth course of the first 20 feet; one ¼-inch rod in every fourth course for the height of the depressed panels; and two ¼-inch rods for every fourth course for the rest of the wall above the arches. This reinforcement is sufficient to protect the wall against all contraction stresses.

A most unusual color scheme was adopted, shading imperceptibly from dark at the bottom to light at the top. Twenty varying color tones are represented in this face-brick exterior. The concrete base was made of ¼-inch gravel specially selected to insure a dark brown shade when exposed by the scrub finish. The beginning brick courses were of a blending shade of dark brown from which the wall gradually shades into a light tan at the top. In the 24 depressed panels the color shading is reversed, dark at the crown of the arch and light at the bottom of the panel, producing a distinct contrast between the panels and the color of the dividing pilasters. The trim, belt



FROM THE TOP OF THE ARCHES TWO RODS WERE USED AT EVERY FOURTH COURSE

courses and window grills, together with the ornamental top course, are of terra cotta shaded to harmonize with the adjacent brickwork. The resultant ensemble is altogether beautiful and pleasing.

The lowest bid on the original design, providing for the use of 150,000 face brick and 600,000 common brick in the back-up, was $74,000. By the use of reinforced brick masonry, the wall was reduced 25 per cent in thickness, and the number of brick for back-up cut to 450,000, by which, with other economies from substituting concrete for cut stone, and terra cotta grills for bronze, the low bid was brought down to $44,500. The brickwork alone cost $22,000.

ACKNOWLEDGMENT.—The illustrations for this article, furnished through the courtesy of *Building Economy*, are from photographs by the Blakeslee-Lane Studio, Baltimore, Md.

A Speedy Police Radio

LESSENING the number of false fire-alarms is one of the unanticipated but welcome results of the Bayonne, N. J., two-way police radio, according to C. J. O'Neill, Police Chief of the town, which installed this last-word improvement a few months ago. So rapid and thorough is the communication system now, since cars can both send and receive calls from headquarters and talk to one another, that fire-alarm jokesters can hardly escape the cruising cars, which are notified immediately of the alarm. The cost of equipping headquarters and nine cars with transmitters and receivers was $4,495; operation is inexpensive. The two-way radio is looked upon with favor for small communities. It is a help in the difficult job of coordinating police service in scattered areas.

Preventing Tuberculation in Water Lines

By LEONARD P. WOOD
Assistant Engineer, Board of Water Supply, New York

LININGS which really prevent tuberculation and maintain carrying capacity are the outstanding development in metal water pipes. The revolutionary changes in manufacture, fusion welding and centrifugal casting have reduced the cost of water mains by a slight per cent. Improved linings, notably cement lining, have increased the sustained carrying capacity for tuberculating waters 20 to 100 per cent.

Notwithstanding occasional exceptions, tar dip on cast iron pipe and innumerable paints and dips on steel pipe have failed to permanently prevent tuberculation. The recognized pipe flow tables show an average loss of capacity of about 25 per cent in 20 years. Sometimes loss is much more rapid, even 20 per cent in three years. Some few waters actually do not cause tuberculation, but every year systems previously thought immune are found to have lost capacity by tuberculation.

Tuberculation causes loss of capacity, inadequate distribution pressure, poor fire flow and increased pumping cost. It requires replacement of old mains, additional mains and feeders, or repeated cleaning. The pitting weakens the pipe structure, to allow for which we arbitrarily increase the thickness of the metal.

The sole purpose of an investment in a water main being to carry water, the value of that investment shrinks as carrying capacity diminishes. If, because of tuberculation, a pipe will carry but three-quarters or one-half of the original quantity, then, unless its capacity is restored, it is worth three-quarters or one-half of the original value. This is being recognized by the appraisers for the buyer in the purchase of water-works plants, by courts and commissions in condemnation awards, and by public regulatory commissions in fixing the rate base.

To summarize, tuberculation not only impairs service and increases operating costs, but it reduces the capital value of a plant and may reduce permitted rates and gross income.

The History of Cement Linings

Cement linings have been used in large steel plate pipe only about twenty years. Six miles of 9-foot 6-inch and 11-foot 3-inch steel pipes in the Catskill Aqueduct, designed by T. H. Wiggin, were mortar-lined and concrete-jacketed, and put in service in 1914 and 1915, 12 additional miles in 1923 and 1924. There is no trace of tuberculation, and the linings are perfect except for microscopic cracks and a slightly sandy surface.

These first pipes were lined in place. Within the last few years fusion-welded steel pipes, up to at least 60 inches diameter, have been mortar-lined, sometimes jacketed with reinforced mortar or gunite at the shop, and shipped to the job and handled much like unlined pipe. There is no apparent reason why much larger sizes cannot be so handled, avoiding the delays of lining and jacketing in the field.

In the field of cast iron pipe, many operators and engineers had talked about the poor quality and inadequacy of tar coatings, and the rapid loss of carrying capacity of their pipes, but to J. E. Gibson belongs the honor of doing something about it. Familiar with the old Phipps patent cement-lined sheet-iron water pipe which showed no loss of carrying capacity after many years, having in Charleston a corrosive soil, and having a very corrosive water which reduced the capacity of new tar-coated mains about twenty per cent in three years, he combined the proved durability of cement pipe-linings with the proved durability of cast iron in his corrosive soil. In 1922, he laid the first cement-lined cast iron pipe in America, 10 miles of 4-inch to 24-inch, made for him by the American Cast Iron Pipe Co.

The use of cement and other improved linings for cast iron pipe has steadily increased since 1922, until in 1930 and 1931, the larger manufacturers were lining from 6 to 13 per cent of the water pipe they produced.

Cement linings, if not too thin, completely prevent tuberculation. Many cement-lined service pipes in use in New England for forty or fifty years have been found entirely free from tubercles except at unprotected fittings. The old cement-lined sheet iron pipes failed and went out of use because of poor design, inherent weakness of the thin stovepipe shell, joint trouble, difficulty of tapping, rust from the outside, or faulty workmanship and unwise economy in cement; the interior of well-made pipes did not tuberculate and the carrying capacity remained unimpaired, even after fifty years. These were natural cement linings. The portland cement linings in the Catskill Aqueduct siphons have perfectly protected the steel for eighteen years, and an experimental lining ¼-inch thick in a smaller pipe is giving perfect protection and is in excellent condition after seventeen years. Well-made cement linings of adequate thickness not only prevent tuberculation but also completely protect the inside of the pipe from structural injury by corrosion and pitting.

Consideration of Specifications

Except for cast iron pipe, there is as yet no standardization of cement linings. The American Standards Association's Sectional Committee on Specifications for Cast Iron Pipe, through a subcommittee under the chairmanship first of J. E. Gibson and later of E. O. Sweet, has adopted a tentative specification which has been in increasingly general use since 1929. This tentative specification was published in the American Water Works Association *Journal* of April, 1932; it was frankly preliminary as befitted a new and changing art; it will be revised and strengthened as experience warrants.

The thickness of a cement lining must obviously be sufficient to prevent tuberculation over a very long period, preferably throughout the useful life of the pipe. It must be sufficient to allow for unavoidable irregularities in the metal. It must also be sufficient to support the lining as an arch if, owing to initial shrinkage of the

mortar, handling, exposure to the weather or other causes, the lining separates from the metal, as it sometimes does, especially in the larger pipes.

There have been wide differences in the thicknesses of cement linings; 1- to 3-inch service pipes have been lined with about ⅛-inch of neat cement, the old sheet iron pipes with ½- to ¾-inch of neat cement or mortar. The linings of shop-lined steel plate pipes must furnish not only protection but enough stiffness to prevent cracking in handling and in the trench. Linings for 24-inch steel pipes are about ½- to ¾-inch thick. A 60-inch steel pipe with 2-inch lining has been successfully shop-lined, transported and laid. When stiffened by reinforced mortar or gunite jackets, the linings are made thinner.

For cast iron pipe, early American practice was an average of 1/16-inch with a plus or minus tolerance of 1/32-inch giving a minimum of 1/32-inch. Experience soon showed this to be too thin, and the tentative specification requires a minimum of ⅛-inch for pipe up to 12 inches, 3/16-inch from 14 to 24 inches. The committee is now considering a minimum of ¼-inch for 30- to 48-inch pipe. English practice has been to use heavier linings, about double the present American thicknesses.

American pipe founders have been reluctant to increase lining thicknesses in cast iron pipe because of the greater difficulty of controlling shrinkage, separation from the pipe, and cracking, with the thicker linings. They are apparently overcoming this difficulty. Some purchasers, also, have objected to thicker linings on the score of reduced waterway. As a matter of fact, because of the permanent smoothness of cement linings, 6-inch or larger pipes with linings of even double the present thickness will deliver more water with the same loss of head than unlined pipe in which tuberculation has reduced the Williams and Hazen coefficient to the very moderate figure of 100. In the Catskill Aqueduct siphons, inserting a 2-inch lining made it possible to actually reduce the diameters of the riveted steel shells about one foot. There is, then, little justification for demanding a thin lining for a slight gain in area, if this involves the risk of shorter life, earlier tuberculation and a smaller ultimate capacity.

Solubility of Cement Linings

All common hydraulic cements contain lime which, even when combined with silica, alumina and iron, as in cement, is slightly soluble in water. The alkalies, always present in small amounts, are also soluble. Consequently, with certain soft waters new cement-lined pipes, particularly in dead ends, tend to make the water harder and more alkaline and sometimes cause complaints.

In cement-mortar pipe linings, the rate of solution rapidly diminishes, but if the water is corrosive to calcium carbonate, the solution of the lime probably never entirely stops until, if the lining is sufficiently thin, the lime is all leached out. Often, as reported by Baylis, Carson and Chappell, the lime is replaced by iron oxide, forming a dense and more or less impermeable membrane within the lining and prolonging its life, but Langenberg, Linderman and Reddick find that this does not always occur. Positive 100 per cent protection of the pipe and prevention of tuberculation are assured only so long as the lime remains and keeps the water in the pore spaces of the lining strongly alkaline. The thicker the lining, the longer the lime will last, and the longer the lining will give 100 per cent protection.

There are, then, three reasons for trying to reduce the solubility of cement pipe-linings: elimination of the occasional complaints of hard water from new lines; prolonging the effective life of linings of the present thicknesses; and eliminating the necessity of using thicker linings for the more corrosive waters if the long life reasonably to be expected from cement linings is to be attained. The problem is being attacked in several ways: by the development of special cements of low solubility; by the selection of the least soluble of the commercial cements, which vary greatly in solubility; by admixtures in the mortar; by special precautions in manufacturing and curing; and by sealing the surface of the cement lining with a bituminous paint or dip, as required by New York City.

Exterior Coating

Whatever value an exterior coating may have, no thin paint of any kind should be expected to give appreciable protection against a corrosive soil. The cooperative investigation of pipe coatings for the outside protection of buried pipe lines, being conducted jointly by the Bureau of Standards, the American Petroleum Institute, the American Gas Association and the coating manufacturers, has shown conclusively that only thick, strong coatings carefully applied and protected from mechanical injury are effective against soil corrosion.

ACKNOWLEDGMENT.—From a symposium on cement-lined water mains, conducted by the American Water Works Association.

Cities' Reports Graded: Berkeley, Cincinnati, Wichita, Lead

"ANNUAL reports to taxpayers, on the order of annual reports by corporations to stockholders, are as yet made by only a minority of cities," comments Clarence E. Ridley, Executive Director, International City Manager's Association. "Included among the cities publishing annual reports are many known for quality government."

Each year Mr. Ridley reviews and ranks the municipal reports of the year. This year Berkeley, Calif., gets first place; Cincinnati, second; Wichita, third. Reports are graded by a system which awards 5 points on each of 20 counts. Milwaukee, ranked as No. 10, got a zero on the count of "Length." This report is 165 pages long, where 50 pages is set down by Mr. Ridley as the maximum length. Kenosha, No. 9, also was reduced in rank by being too long. He contends that longer reports are not so likely to be read.

Other cities with reports listed among the 13 considered worthy of reviewing are: Albert Lea, Minn.; Austin, Texas; Auburn, Maine; Lexington, Ky.; Two Rivers, Wis.; Fort Atkinson, Wis.; Oregon City, Ore.; Tucson, Ariz. Others "worthy of mention" are: Alliance, Nebr.; Atchison, Kans.; Brewer, Belfast and Bangor, Maine; Carlisle and Northampton, Pa.; East Cleveland, Ohio; Tallahassee, Fla.; Rhinelander, Wis.

No. 20 of Mr. Ridley's criteria is "Propaganda." Concerning this point, he says, "It is unethical and in poor taste to include material for departmental or personal aggrandizement. Photographs of officials are out of place." This view is so generally accepted that all of the 13 rated reports get the full 5 points on this count. Mr. Ridley comments further:

Berkeley, Calif. (82, 108) 70 pp. Rating 95.—This report has about everything a model report should have—attractiveness, well-chosen illustrations, and an informative letter of transmittal which emphasizes important facts. The number of employees and total expenditures are given at the beginning of each departmental report. Length and lateness in appearing prevent an almost perfect report.

Cincinnati, Ohio. (451, 160) 64 pp. Rating 93.—Unique in the character of its charts, maps, and pictures, and their distribution throughout the report. Commendable also are the letter of transmittal and the impressive manner of presenting the outstanding accomplishments.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Traffic Accidents Reduced 49 Per Cent

AUGUSTA, GA.—With the advent of the automobile in Augusta, about twenty-five years ago, came traffic accidents, which have increased in number ever since until 1932. There was no organized effort to stop or slow up this terrific destruction of life and property on our highways, until—in the manner of fighting fire with fire—the motorcycle was seen to be a protective agency under police control. When the public realized the situation, motorcycles were employed by the Augusta Police Department in greater numbers, and in the year 1932 the motor-vehicle accident death rate was lowered over 50 per cent in this city of 60,000.

We use nineteen motorcycles to take care of reckless driving, zigzagging, and passing stop signals and control lights—the kind of motoring that kills people. That is the kind of driving that motorcycles are particularly able to prevent.

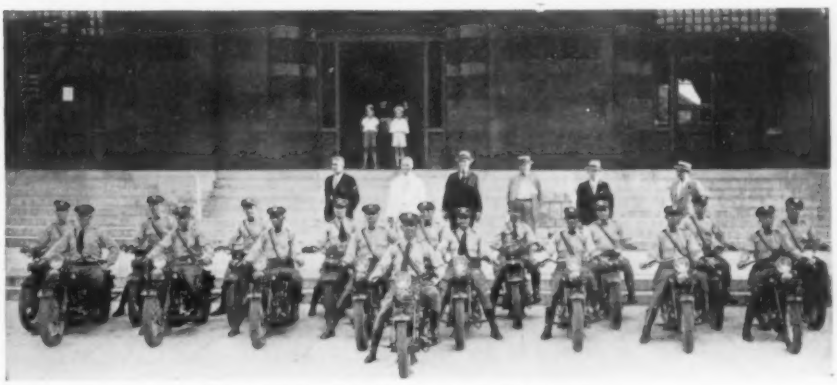
A motorcycle is the quickest and most economical means of enabling a policeman to get anywhere in the city, county and state where he is employed. Our experience shows that the cost of purchase and maintenance of a motorcycle will not exceed ¾-cent per mile, and I feel confident that fines assessed against traffic violators in the city will more than offset the expense of upkeep of our nineteen motorcycles.

Radio is a known aid to police departments in their war against crime, and engineers have developed receiving sets for motorcycles. A police motorcycle equipped with radio is the acme of police efficiency in traffic control equipment. When crime runs into a police combination of this kind, protecting the public in proper numerical strength, it will have to "take the count." A radio-equipped motorcycle squad can do effective work in the apprehension of hit-and-run drivers, drunken drivers, speeders, thieves, and other criminals, because the police no longer have to depend on the telephone or call system in order to keep in touch with headquarters.

When motorcycles are manned by competent police, they are real "lion-driver tamers," and can make the most reckless, drunken, careless and wilful lawbreakers as docile as young kittens. We have done some honest-to-goodness trimming, particularly since the creation of a traffic division, which I had the honor of recommending, supervised by a traffic lieutenant. Our record shows that we were successful in cutting down accidents and traffic deaths by 49 and over 50 per cent respectively.

The entire country needs an efficient motorcycle constabulary to protect persons on the highway and to assist small towns and villages.

G. E. W. BRITT,
Chief of Police.



THE MOTORCYCLE SQUAD OF AUGUSTA, GA.

Profitable Municipal Utilities

JACKSONVILLE, FLA.—This city owns and operates an electric plant, water works, docks and terminals with their own railroad system, a cotton compress and naval stores yard, a broadcasting station, an airport, a golf course, swimming pools and playgrounds. The water works have been operated by the city for the fifty years since their establishment, and the electric plant for about forty years. We have invested in these utilities about $20,000,000, and the net income from them will approximate $2,300,000 annually.

I attribute the success of Jacksonville's utilities largely to the fact that they have been kept out of politics. It has never been the policy of the City Commission to change employees with a change of administration. The superintendent of the electric plant has been with the Department for 32 years, and the superintendent of distribution for about 33 years; all other important positions are held by men who have been with the city from 15 to 25 years. I took office as City Commissioner, in charge of utilities, in June, 1929, and did not discharge a single employee, and no political debts were paid by giving positions to ward-heelers and politicians. There is no doubt that a city can successfully operate its utilities if it keeps them out of politics, but if politics are to be considered in their operation, they are almost certain to become a failure.

During the last three years Jacksonville has continued to operate at high efficiency, not reducing any functions of the city government, and reducing salaries only a small percentage; also hiring more people than in more prosperous times in order to alleviate unemployment, and still we have continued to reduce the tax burden. The per capita tax for 1932 from real estate in Jacksonville was less than $6.

A bond issue of $75,000 was used to build the first electric plant, and the maximum rate established at that time was 7 cents per kwh—one-fourth of the rate previously charged by the privately owned power company. The plant continued to grow and prosper and to take care of all obligations, interest and sinking-fund on bonds, and to make all necessary extensions to plant and distribution system. At present the city has a total investment of $10,000,000 in the electric system, on which there is a balance of $1,387,500 outstanding.

We have installed at the generating station 54,500 kw in generating capacity, with the very latest equipment. The distribution system is constructed to withstand severe storms. During a recent storm, with an average 40-mile wind, when many other areas of the state were thrown into darkness, not a single customer in Jacksonville was without lights. The service extends throughout a total area of about 400 square miles.

The total budget for 1933 was $4,382,000, and the amount collected by taxation was less than $900,000. The balance of $3,482,000 was derived from the earnings of the utilities, delinquent taxes, licenses, fees, etc., the electric plant contributing $2,000,000 of this total. Jacksonville is practically a new city and covers about 37 square miles. It has grown from 52,000 in 1910 to 150,000 in 1933. In spite of many improvements in the last few years, our bonded indebtedness is only $12,000,000, or about $80 per capita.

Our rates for household electricity are recognized as among the lowest offered

in the eastern half of the United States. Our energy charge may seem high to some, but it must be remembered that Jacksonville has no service or meter charge, no cut-in or transfer charge, and none of a number of other charges made by private utilities. Thousands of dollars worth of current, labor and material are given each year to charitable institutions and for civic purposes.

ERNEST E. ANDERS,
Commissioner of Public Utilities.

Telling the Taxpayer What He Gets for His Money

ST. PAUL, MINN.—It is surely a pertinent inquiry: Why are taxes going up when the cost of public services are going down? This matter is dealt with frankly in a 16-page pamphlet prepared by the writer for the Federation of Public Service Employees in St. Paul.

In this pamphlet the average taxpayer in St. Paul is considered—the owner of a $5,000 home, the taxes on which have increased $17.80 in ten years, from $144.80 in 1924 to $162.60 in 1934, including the taxes for the state, the county and the city. But the increase in the city tax is only from $100.62 to $104.24 —3 per cent. In this $104.24 the taxpayer will pay this year:

For	
Public safety—fire, police, health, etc.....	$18.06
Education—schools, library, etc.	28.65
Interest charges and paying off bonds....	27.32
Extra charge due to shrinkage in tax collections	8.24
	$82.27
All other city activities.....	21.97

And what are these other services—34 in number?

Garbage collection; sewer cleaning and repair; snow and ice removal; workhouse; Engineering Department; street cleaning and repair; bridge repair; Public Works Department administration, weed cutting, city dumps, removal of dead animals; all playground expenses; maintenance of parks, lakes, greenhouse, etc.; building inspection; street lighting; municipal airport; public utility investigation, administration, and Testing Laboratories; election costs; offices of City Clerk, Corporation Counsel, Mayor, Finance Department, Comptroller, and the Civil Service Bureau, Purchasing Department, Municipal Court, and Armory; one-half cost of maintenance of new City Hall; one-third of maintenance of hospital, County Home, Veterans' Rest Camp, administration of Board of Public Welfare; assessments on public or other property exempt from assessment; salaries of elected officials; pensions—fire, police, teachers, health, old age, etc.; miscellaneous.

All these cost our householder $8.22 less than they did in 1924, and in 1934 they will even cost $3.28 less than in 1933.

Why, then, do taxes go up? Because of the following increases:

In	
Debt obligations over 1924.....	$10.85
Cost of state government.....	5.94
Cost of county government.....	8.24
Tax shrinkage	8.24
Total increase over 1924.....	$33.27

Here we see where the increase of $17.80 in our householder's taxes comes from. But if he did not have the four increases shown above, his taxes for 1934 would be only $129.33, or $15.47 less than they were in 1924. This amount can well be taken as the amount that he has been saved by the lower costs of furnishing the actual public services that the city government gives him, as enumerated above.

Is giving the city officials less tax money to spend the best way to cut government expenses? If waste and extravagance are rampant in local government, this might have a little effect. But expenses can hardly be reduced by cutting any further the taxpayers' essential services. When that is done, it is the small home owner who suffers most. If fire protection is cut down too much, life will be less secure and his insurance rates will go up; if the health department is not sufficiently financed, there is serious danger of epidemics, and increased contagious diseases; if streets are not kept in repair, it will cost him more money for replacements and for damage suits; if the schools are cut back too far, his children will suffer; if the sewer system is not properly maintained, public health is jeopardized and he may have expensive plumbing bills in his home; and so on in a dozen other instances.

One of the serious defects at the present time exists in our bad tax laws—laws that make it hard to collect taxes from tax dodgers. Every dollar of uncollected taxes means so much more for the small home owner to pay in the following year in addition to his own taxes.

JOS. PAVLICEK,
Accountant, Department of Public Works.

A Financial Record "in These Times"

BINGHAMTON, N. Y.—The following brief letter was written to the City Council of Binghamton on January 2, 1934, setting forth the cash situation of the city at the close of 1933:

The following figures are given for your information:

1. The cash in the General Operating Fund as of December 31, 1933, was $56,272.73. There is, of course, against this certain encumbrances for claims which have not yet cleared through.
2. The cash in the Water Operating Fund is $102,736.17.
3. Expenditures for the year 1933, exclusive of schools and hospital, are approximately $148,000 less than the appropriations. Expenditures in all units of government are approximately $250,000 less than the appropriations.

This condition is attributed to three factors:

1. Conservative revenue estimates by the Finance Department when the 1933 budget was compiled.
2. Careful and judicious spending by the Department.
3. The splendid response on the part of the citizens during this depression in meeting their tax payments.

In addition, certain facts may prove interesting:

1. Tax rate for 1934 has been reduced $1.20.
2. Assessments were reduced approximately $3,000,000.
3. All obligations against the city were met when due—no bonds refunded—no tax anticipation notes issued.
4. Although there have been unusual welfare demands, the total indebtedness of the city over the past two years has been reduced slightly in excess of $450,000.
5. Tax collections for 1932, 99.73 per cent; for 1933, 91.17 per cent.
6. The statement of cash in the accompanying letter does not include the cash balances in sinking or trust funds, but only the operating funds.

C. A. HARRELL,
City Manager.

Why Not "Plow Under" Obsolete Buildings?

"The government is plowing under cotton, killing hogs and paying farmers to take good land out of production. Why not 'plow under' obsolete buildings unsuitable for human habitation when there is a surplus of satisfactory buildings?"

SEARCH for a plan, perhaps to be financed in part at least by Federal and municipal funds, for eliminating unsightly, seriously deteriorated buildings from downtown and adjacent districts, has been undertaken by the Real Estate Board of Kansas City, Mo., through a newly established division on public improvements. In his inaugural address of January 12, from which the foregoing paragraph is quoted, President Byron T. Shutz suggested that the city might acquire the land, and the Federal Civil Works Administration pay men to raze buildings, grade and beautify the sites, the cleared areas to be used for motor-car parking purposes.

The division undertakes its study with an open mind, and is receiving suggestions. One is that downtown retailers and property owners, individually or in groups, might buy obsolescent structures, for razing, and then provide parking grounds, either free or maintained with adequate charges. Merchants have taken similar action previously, for example, in providing a bus station at a location favorable to established retail trade. Several large retail stores now give tickets to customers or visitors for free parking privileges.

Opinions differ as to the desirability of extensive free parking privileges for the general public; the new division will study the subject. It is expected that one aspect of the study will be means for improving the appearance and service of numerous commercial parking stations in or adjacent to the downtown district. The division is expected to consider the interests of the whole city—for example, the advantages and disadvantages of free public parking stations in outlying as well as downtown areas. Interests of owners having large investments in garages and parking stations are to be considered.

While every possible means of obtaining money from Federal, state and local sources for securing possession of ground, razing buildings, beautifying grounds or rendering them serviceable, will be examined, caution is also being urged against such involvement in governmental control as might interfere with normal business processes.

B. S. BROWN.

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

Terminal Facilities— Motor Transport's Greatest Need

CHIEF essentials to the continued popularity of private automobile transport as compared with public facilities are convenient origin, comfortable and safe transit and satisfactory terminal facilities, in the opinion of C. A. Hogentogler, E. A. Willis and J. A. Kelley, of the United States Bureau of Public Roads, as developed in a paper on "Intangible Economics of Highway Transportation," presented before the Highway Research Board in December, 1933, excerpts from which follow:

Resident emigration to suburban districts has done much to provide origin facilities; ingenuity of motor-car design combined with increased road widths, better alignment, easier curves with greater sight distances, and modern traffic control methods and mechanisms, have done much to expedite safe transit.

The destination or parking space, in contrast, seems to have been left out of physical considerations, causing progress in terminal facilities to consist in the main of legal restrictions. Even current technical literature reflects the neglect of terminal facilities. Thus, for instance, in a bibliography consisting of 802 articles on traffic engineering, but 47 concerned parking and, of these, 41 had to do with regulations, leaving but 6 to deal with actual terminal structures or parking space.

The graph illustrates the effect of the absence of terminal facilities. It was obtained by recording the times by means of a stop watch corresponding to odometer readings on different routes during the morning rush hour.

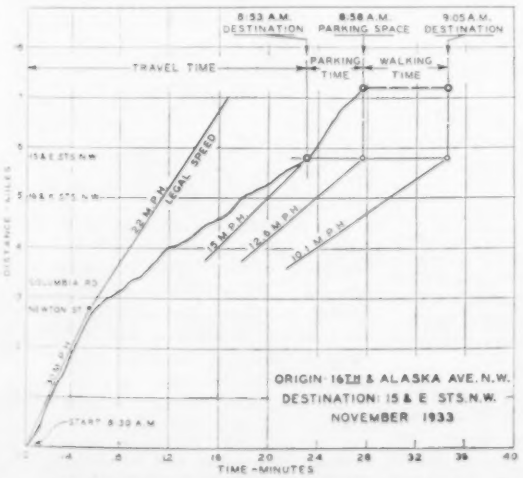
The distance traveled down Sixteenth Street is plotted against time. The distance from origin to destination equals six miles. The upper curve shows that at 5 A.M., in the absence of travel, almost the maximum legal speed is maintained, thus allowing the trip to be made in 14 minutes.

During the rush hour, however, the average speed from origin to destination is reduced to 15 miles per hour, requiring 23 minutes. At the end of 5 additional minutes spent in finding a parking space, it drops still further, to 12.6 miles per hour, and an additional 7 minutes spent in walking back to the destination brings the final average to 10.1 miles per hour.

The consideration of terminal facilities concerns not how much the car owner is willing to pay for such service, but instead the expenditure justified by sound economics to increase the speed, comfort and safety of the entire traveling public by removing parked cars from the highly expensive street surfaces to off-curb parking areas with less expensive surfacing.

Parking space is not merely a personal convenience for car operators, but an integral part of economic motor transport. Consequently, expenditures justified for its provisions can be computed on the same basis as expenditures for increased road width, smoother riding surfaces, reduced curvature, greater sight distance, wider bridges, and better alignment. Included also is the effect of adequate terminal facilities for putting more cars in service, with their purchase price going to pay the cost of wages and materials of manufacture, and their operating costs for tires, gas, oil, repairs and insurance going to increase the general industry and prosperity of the nation.

Whether an individual is willing to pay 10, 20 or 50 cents per day for parking facilities is subordinate to the placing in service of additional units of transportation which contribute considerably to the commerce of the community and the nation.



GRAPH ILLUSTRATING THE EFFECT OF LACK OF TERMINAL FACILITIES

Economies of Adequate Parking Facilities

Savings which accrue from provision of adequate parking facilities might be computed from several bases as follows:

1. The difference in value of parking lot and street surface.
2. The increase in speed of travel of moving traffic due to wider roadways.
3. The reduced operating costs due to shorter distances of travel.
4. Saving of time when necessity for hunting parking space is eliminated.

On the assumption that parking space can be covered with cheaper surfacing than street surfaces, additional savings can be estimated. If this difference amounts to $2 per square yard, the capital savings for 400 cars occupying 2 miles of curb space and requiring about 7,000 square yards of off-curb space would amount to about $14,000.

On the basis of 20,000 cars per day, which can be taken as the traffic on a main artery like Pennsylvania Avenue, the savings due to increase of speed of travel due to parking elimination could be enormous. If this increase of speed were only 5 miles per hour, say from 15 to 20 miles per hour, the time saving in a year of 300 days amounts to 6,000,000 vehicle-minutes per mile annually.

At one cent per vehicle-minute, the saving proposed by Sigvold Johannesson in his book, "Highway Economics," the annual return becomes $60,000 per mile annually, or the interest at 5 per cent on $1,200,000.

The average distance from destination to parking space in the Sixteenth Street run and two other runs considered in the study equaled 1.65 miles. At 400 cars per day, 300 days per year, this becomes 198,000 miles, which, at 5 cents per mile, costs $9,900 per year. This capitalized at 5 per cent is equal to $198,000.

I venture no estimate of the value of the time which must be spent in walking back to the destination. This is one of the "musts," however, which diminish the intangible returns which have made the highway and motor satisfy a national transportation need not furnished by any other type of transportation. All such necessities introduce into motor transport the type of irksome travel restrictions which motor transport is designed to eliminate. Exclusive of this item and also of any carrying charge on the valuation of the street area, the savings accruing from placing 400 cars per day in off-curb space per mile of street carrying 20,000 vehicles per day becomes

$14,000 + $1,200,000 + $198,000 = $1,412,000.

The cost of providing the 1½ to 2

acres parking space for the 400 cars subtracted from $1,412,000 represents the profit due to furnishing off-curb space for parking the cars now occupying one mile of street. Thus, like the old argument for good roads, "We pay for parking space whether we have it or not, and it costs more not to have it than to have it."

Other Needed Highway Improvements

Along with the parking facilities we might include also other fields of change in physical structure which are justified part by the tangible and part by intangible economics. Such problems include the following:

1. *Development of design of sidings for expediting traffic on two-lane traffic roads.*—With mixed traffic of appreciable amount on two-lane traffic roads, the speed of traffic is practically that of the slower-moving vehicles. To increase the width of all such roads as occasion demands is a physical as well as a financial impossibility. However, single-lane sidings placed at proper intervals to furnish a three-lane road, especially on upgrades where the faster units can pass the slow-moving traffic, will accomplish much toward speeding up traffic.*

2. *Development of anti-skid high-speed road surfaces.*—The annual casualty lists of about 30,000 killed, 85,000 permanently and 945,000 temporarily injured in highway transportation is contributed to largely by skidding automobiles. This is reason enough for studying the mechanics of skidding and the prevention measures in both construction and maintenance. Here it might be necessary to increase the cost of operation due to greater tire wear in order to reduce expensive loss of life.

3. *Development of methods for segregating pedestrians from auto traffic, especially in urban districts.*—This is to make a further cut in the casualty list and to speed up traffic as well, because, according to estimate, pedestrians are concerned in about two-thirds of the traffic accidents.

For years, attempts have been made to legislate pedestrians into certain locations for crossing streets. Even at these designated locations, pedestrians have to be more and more alert and be able to look in three or four directions at the same time to prevent being run down. This is not only a city problem, for the by-passing of small towns is but a temporary expedient which lasts only long enough for the gas station, the barbecue, the drug store and the rest of the town to move to the new location.

The only logical remedy is for research to devise the means for gradually preventing pedestrians from using the street roadway, thus following the example of Radburn, N. J. The design of underpasses and overpasses, and the selection of their proper location for accomplishing this, combined with the design of accompanying parking areas, loading platforms and corresponding methods of traffic control, furnish an almost unlimited field for improvement in highway transportation.

The railroad engineer has been solving a similar problem for the past half-century. Prohibitive restrictions made increasingly necessary the separation of tracks from the street grades on which rail transportation originally developed. This called for new routes and often new terminals as well. Terminals with through routes for highway transportation can follow the same general principles of design and economic justification.

If suggestions such as these are considered impractical and the highway field is fully developed, and if in the city the curb line is considered the ultimate barrier beyond which the highway builder may not pass, the field of future motor transport development is indeed limited. If, on the other hand, we are willing to recognize that scientific inquiry into new fields of structural design can promote the comfort, speed and safety of highway transportation, the road builder has an unlimited field.

A STORE PARKING AREA OF MODERN DESIGN

* EDITORIAL NOTE.—See THE AMERICAN CITY for December, 1933, page 70, and January, 1934, page 76.

Massachusetts Highway Accident Survey

A RECENT report of the state of Massachusetts shows that 60 per cent of the automobile accidents on the highways of the state are caused by 12 per cent of the drivers. To enable local authorities to determine safe speeds and methods of vehicle operation under varying conditions and improve enforcement of safety regulations, is the two-fold purpose of an important survey of highway accidents in Massachusetts now being conducted for the Massachusetts Institute of Technology under the direction of Colonel R. C. Eddy, Chief Traffic Engineer of the Massachusetts Department of Public Works. The work is being done with CWA funds, and in conjunction with the Departments of Public Safety, and Public Works, the Governor's Committee on Street and Highway Safety and the Registrar's Office.

Engineers are analyzing all accident records of the last four years involving personal injury. From this information spot maps are being made. Field engineers are augmenting these records from local reports and making field studies. The result of this will be definite recommendations to each locality in regard to stop signs, traffic lights, road construction, etc., which can be followed by the local authorities after the completion of the present survey.

The project of primary concern to the Department of Public Safety is a study of highway speeds and law observance. Speeds will be checked at all key points on the principal highways of the state. Motorists' observance of stop signs and traffic signs will be checked at some 1,500 points; also practice in overtaking and passing cars when the view is obstructed, keeping to the right, and making proper turns. Finally, this study will be related to the volume of traffic and to the accident records of the roads involved.

Institute Members Elected

AT a meeting of the Board of Direction of the Institute of Traffic Engineers in New York on January 15, the following were elected to membership:

Walter H. Klapproth, Assistant Highway Engineer, Illinois State Highway Department, LaGrange, Ill. (Member)

W. E. De Young, District Manager, Automatic Signal Corporation, Chicago, Ill. (Associate Member)

Phillip X. Rice, Assistant Professor of Electrical Engineering, Pennsylvania State College, State College, Pa. (Affiliate)

Lieut. Herbert McCaske, In Charge Traffic, Survey Bureau, Detroit Police Department, Detroit, Mich. (Affiliate)

Dwight M. McCracken, State House, Boston, Mass. (Junior)

Ralph S. Lewis, Bureau of Traffic Planning, Pittsburgh, Pa. ((Junior)

The fifth annual meeting of the Institute of Traffic Engineers will be held in Cleveland, Ohio, during the week of October 1-5, 1934. Meetings will be held during two days, probably Tuesday and Wednesday, October 2 and 3. Definite announcement of the dates will be made later in these columns.

The following changes in membership grades were also approved:

W. Graham Cole, Director of Safety, Welfare Division, Metropolitan Life Insurance Co., New York City. (Affiliate to Member)

Maxwell N. Halsey, Traffic Engineer, National Bureau Casualty & Surety Underwriters, New York City. (Associate Member to Member)

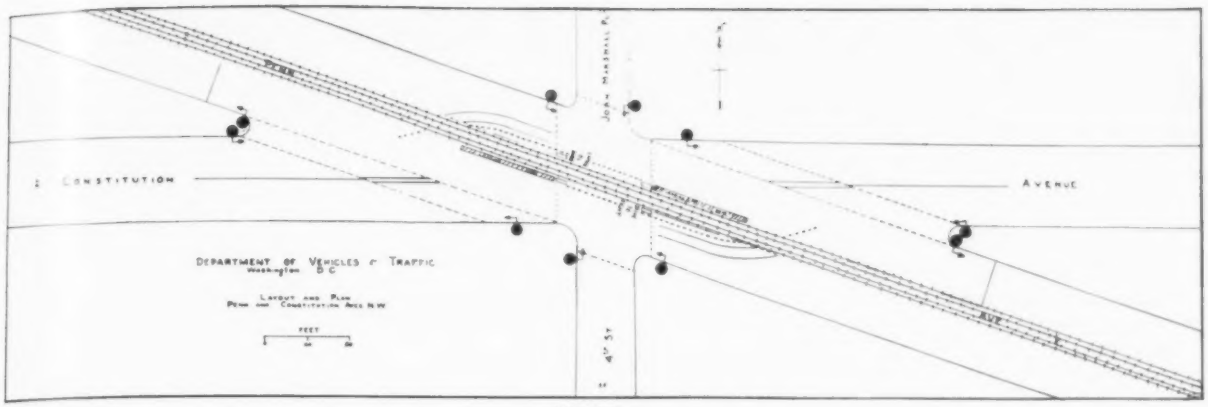


FIGURE 1

Controlling Traffic at a Six-Way Intersection with Two-Phase Traffic Lights

By **M. O. ELDRIDGE**
Assistant Director, Department of Vehicles and Traffic, Washington

CONSTITUTION Avenue, Washington, D. C., opened to traffic through the intersection formed with Pennsylvania Avenue and John Marshall Place, has become of extreme importance in the highway plan of the District.

Constitution Avenue has an 80-foot roadway and Pennsylvania Avenue a 107-foot roadway. Owing to their great width and the small angle of intersection, about 18 degrees, a very long intersection was formed—680 feet between the east and west points of Constitution and Pennsylvania Avenues. This situation is further complicated by John Marshall Place passing through the center of the intersection. The long crossing distance of this intersection presented great difficulties. The scheme of control decided upon, and now in operation, is as follows:

Street-car loading platforms were placed as shown by Figure 1, along the car tracks at John Marshall Place, running back a distance of 95 feet from the crosswalk lines. These platforms materially lowered the crossing distances, forced Constitution Avenue traffic to merge with Pennsylvania Avenue, and broke the intersection into what is, to all intents and purposes, three intersections. It then became necessary to provide adequate protection for pedestrians and each traffic stream while maintaining continuous flow through the intersection.

The traffic signals were placed in position on August 17, 1933. The signals were placed as shown in Figure 1, and a coordination was worked out as shown in Figure 2. A 46-second cycle will give the smoothest operation through the intersection, but in order to secure synchronization with other signals on Pennsylvania Avenue and those later to be installed on Constitution Avenue, the signals at Pennsylvania and Constitution Avenues were tied into the Pennsylvania Avenue system, with a master timer set for a 55-second cycle. This timing limits the speed on Pennsylvania Avenue to about 18 miles per hour.

The direct current secondary timers were used to secure coordination through the intersection—one timer operates the six signals at John Marshall Place, and the other operates the four signals at the east and west points of the intersection. The division of time is shown on Figure 2.

The traffic flow through the intersection during the peak hour is shown by Figure 3. The left turn into Constitution Avenue was allotted 30 seconds of the 55-second cycle, even though the traffic on Pennsylvania Avenue in the opposite direction is equal to, or much greater than, the left-turn traffic. This was done in order to secure better coordination through the intersection, and because Pennsylvania Avenue has one more lane than the left turn. The 25-second allotment of time for Pennsylvania Avenue has proved quite adequate.

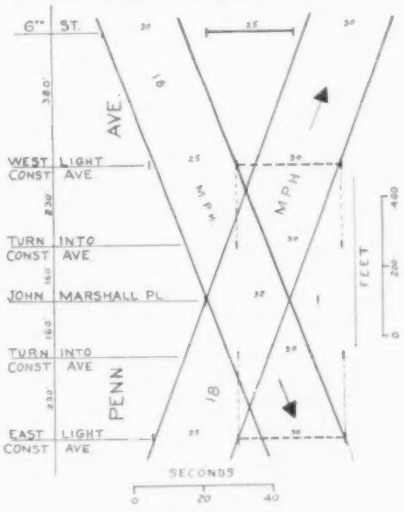


FIGURE 2

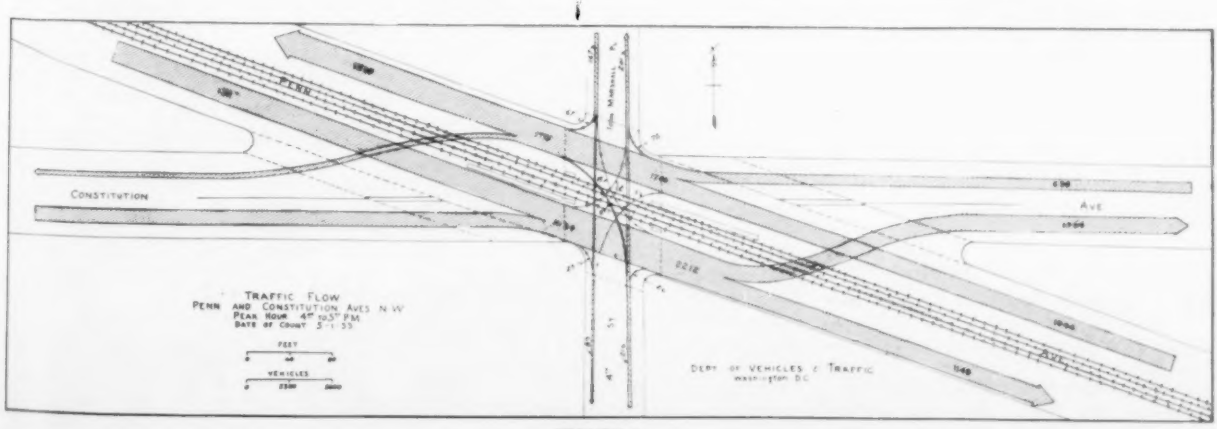


FIGURE 3

Improving Municipal Administration

Current Items from the Public Administration Clearing House

Catching Criminals by Federal-Local Police Cooperation

CAPTURE of 425 fugitives in December, 1933, as a result of posting of notices of wanted persons by the Division of Investigation of the U. S. Department of Justice, is cited by Charles Wheeler, President, International Association of Chiefs of Police, as a good example of the efficient way in which Federal, state and local police forces work together. "This is a little better than we usually do," Mr. Wheeler explains. "An average month's 'catch' is 350."

A statement by J. Edgar Hoover, Director of the Division of Investigation of the Department of Justice, describes specific aids to local police forces made available by the Federal agency:

1. *Identification Unit, for Fingerprint Records.*—At the present time there are 4,071,225 fingerprint records on file—the largest and most complete collection in the world. The unit receives criminal identification data from over 6,000 contributors in the United States. One day's mail may include 2,200 fingerprint queries, each of which must be reported on within 36 hours. The single fingerprint file installed about a year ago has in it the prints of 3,949 criminals, ready for comparison with latent fingerprints found at the scenes of crimes.

2 *Quarterly Publication of Crime Statistics.*—Begun in January, 1930, as a monthly bulletin of the Committee on Uniform Crime Records of the International Association of Chiefs of Police, the investigation division took over this work six months later. Data on crimes committed are summarized in tables, to show the extent of crime during a particular period.

3 *"Fugitives Wanted by Police."*—A monthly bulletin listing names, aliases, descriptions and fingerprint classifications of wanted fugitives, with addresses of officials seeking them. More than 6,394 law enforcement officials and agencies receive the bulletin, they in turn forwarding fingerprints for the files.

4 *Distribution of Handbooks to Local Authorities.*—Many articles and handbooks dealing with civil identification, how to take fingerprints, and other subjects of interest to law enforcement agencies are sent out from time to time.

Bringing Tax Collections Up

BY offering discounts for advance payment of taxes, Lewiston, Maine, (pop. 34,948) has avoided tax-anticipation borrowing in 1933 and is now expecting to have a cash balance on hand February 28, 1934. Discounts offered were 5, 4, 3 and 2 per cent on taxes paid in the months of May, June, July and August respectively.

Installment paying of taxes, with and without discounts, is a method that has been used by 90 of 99 cities recently queried by the American Municipal Association. Augusta, Ga., has had installment collection of city taxes for the past thirty years. Failure to meet any of the three set payments in April, July and October causes all taxes to become due in this city, with 10 per cent penalty and 50-cent costs.

Baltimore, Md., employes a "passbook" system, similar to the savings bank idea, opening an account for the taxpayer, against which he deposits his tax-payments. When a certain amount is paid, the credit is transferred to the general books; when all is paid, the account is closed. Discounts are allowed on the amounts for current year's taxes paid during a certain period.

Fee System Attacked

A MARKED tendency toward elimination of the fee system of paying local government officials is seen by Robert M. Paige, Secretary, Governmental Research Association. "Practically all studies looking toward reform in local government recommend abolition of the fee system." Mr. Paige says. "The trouble with it is that it results in underpayment for some officials and gross overpayment for others."

A model salary act, designed to curb the fee system and curtail expenditures for salaries, proposed for enactment in Arkansas as a measure toward county government reform, is described by Kenneth O. Warner, Chairman of the Arkansas People's Conference on Government, in the current issue of *Public Management*, official journal of the International City Managers' Association.

The act fixes the compensation, expenses and manner of paying certain county officials, as well as the number and salaries of their deputies. Details proposed follow closely provisions of a 1932 salary law enacted by initiative and referendum in Union County, Arkansas. As a result of the Union County law, which the Arkansas Supreme Court pronounced constitutional, savings estimated for the first year were $30,000, an amount approximately equivalent to the cost of the sheriff's office alone in 1932. The economy was also equivalent to 1½ mills on the county's assessed valuation.

Responsibility for sponsoring the model act will rest with the 33 County Taxpayers' Associations which drew it up with the cooperation of the Arkansas People's Conference on Government and the State Chamber of Commerce.

Permanent Registration Saves Money

HOW cost of registering voters can be reduced from an average of 75 cents per vote to an average of 29 cents a vote is revealed by information recently compiled by the American Municipal Association. The higher average cost is that of a group of typical cities which register voters every year or two. The lower cost is the result of installing a system of central permanent registration, which does the job once for all. Incidentally, this procedure saves voters the annual bother of having to register. Opportunity for fraud is greatly minimized. Each voter signs his name at the time he votes; his signature is compared with that on his permanent registration card.

Of 63 cities using this improved system of registration, only one has found it neither satisfactory nor economical. St. Paul, Minn., reports an annual saving of $35,000 by its use. Among other cities employing permanent central registration are Cincinnati; Denver; Detroit; Elizabeth, N. J.; Glendale, Calif.; Haverhill, Mass.; Los Angeles; Milwaukee; Minneapolis; Norfolk; Portland, Ore; Richmond and San Francisco.

Model System of Public Works Records

FLINT, MICH., has completed installation of a new records system in its Public Works Department, designed to improve accounting, auditing and administrative procedure. The Michigan Municipal League has cooperated in working it out. Public Administration Service, which did the work of installing it, has just published a detailed report on it. This system is expected to be a model for public works records in other cities: it cuts the "paper work" of government, yet yields figures which give executives real control. Real economy results.

What Price Municipal Fire Insurance?

WHEN Mayor Harry L. Davis of Cleveland took office recently, he pledged himself to establish a city fire insurance fund, having found that in the past ten years, 1923-32, Cleveland paid out to private insurance companies premiums of $393,849, while the fire losses collected amounted to only $67,683, a little over one-sixth. Cost of insurance on the city's property has increased from $3,908 in 1913 to $82,189.43 in 1932.

Fire insurance protection of city properties, no small item in the budget, has been taken care of by municipalities in

four ways: by insuring with private companies; by establishing a state insurance fund, as Wisconsin and North Dakota have done; by maintaining a city insurance or replacement fund, as established in such cities as Philadelphia and Toledo; by carrying no insurance protection but meeting fire losses, when they occur, out of bond issues or general revenues, as is done in New York, Chicago, San Francisco. There seems to be no definite policy that can be laid down for cities of all sizes. Very large cities, with many widely scattered buildings, many of which are fireproof, it has been pointed out by students of the problem, are probably wasting money when they buy fire insurance protection.

Whatever method of insuring is used, there are other measures in fire administration which are equally important for economy's sake, as pointed out in "How Cities Can Cut Costs," a publication of the International City Managers' Association.

Keeping an insurance rate down in some localities depends in part upon the average amount of fire losses. Therefore, fire prevention, practiced to the highest degree of efficiency, is an obvious economy.

Another step in economy is to have frequent re-appraisal of properties over the city, to avoid over-insurance, and in some instances, to have insurance canceled. For example, until recently, one large Middle Western city heavily insured its part-concrete bandstands, which, being in parks, were practically free from fire hazard.

"Apprenticing" for City Hall Jobs

"AS life and institutions become more complex, the need increases for competent, specially trained people in governmental administration, not only in key positions but also in what have hitherto been regarded as less important positions." So asserts Clarence E. Ridley, Executive Director, International City Managers' Association. He adds, "The shortage of such qualified administrators is a serious one."

Having spent some weeks in Germany during the past year studying local government there, Mr. Ridley points out that the German system of apprenticing each year some 2,000 promising young men in subordinate city hall jobs contributes in a substantial way toward building up efficient machinery of local government. "A system of apprenticing, such as Germany has developed, might profitably be followed more widely in this country," he says.

In Cincinnati, under leadership of City Manager C. A. Dykstra, a number of young college men, mainly from the University of Cincinnati, are employed. They are sprinkled all through the city departments.

Recognition of the increased demand for trained administrators, due to extensions of governmental activity, is seen in an announcement by Ernest J. Bohn, President of the newly formed National Association of Housing Officials. One of the first activities of this organization will be to assist in finding and training the personnel needed to shoulder the new public responsibilities resulting from the new developments now taking place in the field of housing.

California Cities Hold "Open House"

SHOWING citizens what makes the wheels go 'round was the object of two California cities—Oakland and Berkeley—which during the past few months have held "open house" at the City Halls. Exhibits of work accomplished and services being rendered by the various municipal departments were displayed, so that taxpayers might discover for themselves some of the functions undertaken. The Oakland City Hall had 16,000 visitors for the occasion.

City Revenue from Minor Highway Privileges

BALTIMORE collects about $190,000 a year by selling what many towns and cities give away for nothing—the privilege of using public property for private purposes. An increasing number of other cities are doing the same thing. Boston collects $69,000; Milwaukee, $10,679; Oak Park, Ill., $5,930; New Rochelle, N. Y., $3,774. For further details on this subject, see pamphlet listed under "Revenues" in the department of Municipal and Civic Publications in this issue.

Cities Should Receive Larger Share of Gasoline Taxes

HAT a larger allocation of gasoline tax revenues should be made by states to cities for construction and maintenance of streets, and that imposition of a Federal gasoline tax tends to discourage such allocation, a report by Dr. Clarence Heer, of the American Legislators' Association, declares.

Recent traffic surveys indicate that about half of all the mileage traveled by motor vehicles in the United States is on city streets, the report points out. This means that half the gas taxes are collected on fuel burned within city limits. Despite this fact, of 513 million dollars collected through state gasoline taxes in 1932, only 19 millions, or less than 4 per cent, was returned to municipalities. Only nine states allowed cities to participate in the gas tax at all.

Street costs are a heavy item in municipal budgets, Dr. Heer observes. In 1931, cities of 30,000 and over spent 588 million dollars on city streets, about 14 per cent of their combined expenditures for all purposes. These cities had outstanding $1,458,627,000 of street improvement bonds, representing about one-fifth of their total indebtedness. In some cities the proportion of street indebtedness to the total is over 50 per cent. Being denied access to gas tax funds to meet such obligations, cities have to rely on the general property tax. Failure of this source has contributed to widespread defaults in municipal bonds.

Regional School for Policemen

POLICE Chief Charles A. Wheeler, of Bridgeport, Conn., President of the International Association of Chiefs of Police, calls attention in the January issue of the *Police Chiefs' News Letter* to the regional schools for police training that are being carried on for the smaller cities in New York and Virginia. These schools are operated under the joint auspices of the state Police Chiefs' Association and either the state League of Municipalities or the state Conference of Mayors. More than 3,000 police officers attended sessions during the past year, receiving from six to ten weeks' instruction.

Minnesota, Kansas, Oklahoma, Colorado, Wisconsin and a number of other states hold annual police institutes under the auspices of state Police Chiefs' Associations and state Leagues of Municipalities also. Formerly, large cities only were equipped with police-training schools, partly because of the high cost, and partly because the smaller cities had too few men on the force.

Both elementary and advanced instruction in such subjects as criminal law, correct testimony, crimes and their classification, arrest procedure, use of firearms, first aid, patrol methods, etc., is offered. In this way police officers in small towns and rural areas are given the opportunity of participating in a course of training that otherwise would be far too costly to provide.

The Municipal Bond Market

Recent sales of new issues, from January numbers of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$275,000	Worcester, Mass., Improvements	3.5	6.5 (Avg.)	3.37
2,300,000	St. Louis, Mo., Relief	3.75	4-5 1/3 (Opt.-Avg.)	3.73
1,500,000	St. Louis, Mo., Hospital	4	12¼ (Avg.)	3.81
1,335,000	Reading, Pa., Water Improvement	4	15 (Avg.)	3.997
6,806,000	Allegheny Co., Pa., Road, Park, Uncollected Taxes	4	8 (Avg.)	4
1,000,000	Minneapolis, Minn., Sewage Disposal System	4	16.5 (Avg.)	4
2,000,000	Syracuse, N. Y., Welfare	4.10	1-10 (Ser.)	4.09
250,000	Kansas City, Mo., Trafficway, Hospital	4.25	11	4.25
1,100,000	Onondaga Co., N. Y., Highways, Relief	4.40	9 (Avg.)	4.38
150,000	Minneapolis, Minn., Improvements, Relief	4.5	2-11 (Ser.)	4.49
125,000	Duquesne, Pa., Emergency	5	6-10 (Ser.)	4.80
250,000	Columbus, Ohio, Sewerage and Sewage Disposal	6	2-26 (Ser.)	5.95
438,000	Stratford, Conn., General	5.5	5 1/3 (Avg.)	6.48

British and American Systems of Real Estate Taxation Compared

To the Editor of THE AMERICAN CITY:

In your October issue I note the discussion between Professor Griffith and Thomas Adams on "The British System of Local Taxation." As Mr. Adams comments: "The difficulties involved in changing the system of taxation in the United States to correspond with the British system would be almost insurmountable; and if the change were made, it is very doubtful if it would be to the advantage of American cities." The disputants therefore agree that change from a capital-value assessment to an income-assessment basis would be of doubtful value. This, then, disposes of the main issue.

Mr. Adams contends, however, that "the valuation of landed property in America for all purposes, including its assessed value for taxation, should be based on income value. "This is fundamentally important," he says, "whatever the system of taxation." This same argument is being presented of late with increasing fervor by holders of income-property in the United States. Would such assessment be to their interest? I do not think so.

By way of illustration, suppose that the building value of a city is $300,000,000, that the land value is $300,000,000, one-half of which, valued at $150,000,000, is vacant. To levy $2.50 on the $300,000,000 building value, plus $300,000,000 land value, would produce $15,000,000. To produce this $15,000,000 on $300,000,000 improvement value, plus $150,000,000 land value (exempting the vacant $150,000,000) would require a tax levy of $3.33 per $100 of value assessed. Thus, a building assessed at $30,000 and land assessed at $15,000, total $45,000, would bear an extra burden of ($3.33 — $2.50) × 450 [hundreds of dollars], or $373.50. This shows the increased burden on improved land value resulting from exempting vacant land.

Difficulties in Determining Actual Income

The practical difficulties involved in obtaining accurate and reliable information in assessing the "actual" income of real estate are: (a) in thousands of cases the property has been recently inherited or purchased, and the owners know little of the past performance of the property; (b) thousands of owners keep no books of record; and (c) in many taxing districts one-half of the property owners do not live on the assessable property, therefore citations do not reach them and their property would be assessed without exact information.

In analyzing such income statements received, it is necessary for the assessor to consider the structural depreciation rate taken, as well as the obsolescence depreciation rate. It is necessary to check the amount of insurance, to scrutinize the management, and to know whether the building is suitable to the neighborhood and is adequate to the site. Inordinate repairs frequently are charged for one year that should be spread over a period of years. Some repairs should be charged to capital rather than to operating expenses. In submitting income and expense statements, large amounts charged under "miscellaneous" probably include interest, rentals or other debatable charges. It is necessary further to compare such data for a series of years —for no property, manifestly, sells or is valued by buyers on a basis of net income for a single year. It must be evident that these things involve an intimate and costly study in each case.

Such value fixed on loose, inaccurate, in many cases untruthful, ephemeral data, filed in the year of assessment, would belie the facts and conditions existing in the year of payment; indeed, this would result at every change of tenancy, every change of occupancy. Such valuation would prove in a falling market as unsatisfactory to property owners as present assessments based on fragmentary evidence of a theoretical market.

In assessing real estate on actual income it would be necessary to reappraise every year, for income and expense change each year, whereas capital value based on sales is less subject to fluctuation. Income appraisal would require an army of investigators and valuators. Its very particularity in the hands of so many assessors would destroy its uniformity and prove its undoing. It would cost many times as much as at present.

What Are "Average Rentals"?

But if income property cannot easily be appraised on "actual income," the question arises whether it may not be assessed on assumed income based on "average rentals" for similar property in the vicinity. "Average rental," as distinguished from the "actual rent" collections, involves a comparison of actual rental paid for similar property in the neighborhood. If it is difficult to arrive at actual rentals, how much more difficult it must be to arrive at an average. Many properties are paying no rent today, many are occupied under an agreed rental with many months in arrears. Others are getting allowances, deductions and considerations of various kinds, such as free rent the last month of the term, a waiver of decorations, maintenance of the premises by the lessee, and so on. The variations today in current rental are indeed grotesque. Few assessors, realtors or owners would agree on an average rental value of a dozen dwellings or other improved properties when not of a standard type; especially is this so on streets changing in use. Let us not forget that many costly buildings, on streets undergoing a change in utility, grace very valuable lots, valuable in use to the owner but of little rental value to the public. Appraise in your own neighborhood a dozen nearby dwellings of varying value, then ask the owners how far they approve your estimates. You will be astonished.

It will be borne in mind that the English assessment is not fixed on a basis of actual net income. There the value assessed is the assumed net rent which a hypothetical tenant of such property would, taking one year with another, pay for it. The estimated gross rental is the annual rent a hypothetical tenant would pay if he undertook to pay all usual tenant rates *and taxes*. From this gross rental value a deduction for repairs, insurance and other expenses, necessary to maintain the premises in a state to command that rent, is allowed. The balance is the taxable value. This assessment is something far different from what the average American assumes it to be. It is not an assessment on actual income, nor does it allow actual expenses as a deduction. Simplified somewhat by statutory maximum allowable deductions, it is still exceedingly difficult to estimate the annual income of a hypothetical tenant, quite similar to the hypothetical willing buyer and seller in the American states.

The fact of the matter is that American methods of assessment are probably, at least in our more modern cities, more democratic. Assessments are fixed more or less in cooperation with the public, through equalization maps, through publicity of all assessments, both in their initiation as well as during their continuation, with uniformity the main purpose. Assessments based on income involve such a zigzag, indefensible nature, that few property owners would acquiesce in the assessors' deductions, while no public official could justify them or stand up under the apparent discriminations.

A discussion, however, of the comparative value of assessment of gross annual or ratable values, as termed in England, with the American capital value method, is largely academic, inasmuch as almost all state constitutions provide for the taxation of real estate on the basis of value, true value, fair value or other term for the most part judicially interpreted as the market value.

Relative Wealth Absorbed Through Taxation

Mr. Adams says that "local taxes in American cities are much higher than in English cities." "This indicates that they [American cities] do absorb more private wealth for public uses." This is interesting. "More" private wealth is probably so taken, but is the absorption greater relative to the value, greater in percentage? Whether or not private

wealth is absorbed, is best indicated by the effect of taxation upon the value of property. If the tax imposed is confiscatory, all other things being equal, a decline in value of the property assessed results. If real property keeps going up under heavy taxes, it would seem as though the burden were not excessive, the usual complaint of property owners to the contrary notwithstanding. And vice versa, when it goes down, due to the heavy tax, all other things being equal, then the tax is burdensome and confiscatory to a degree (all taxes being confiscatory more or less).

If we thus approach the question of relative wealth absorbed through taxation, we find no self-evident answer. It involves a very complex and statistical approach. Land values have increased greatly in England, but I doubt whether they increased in the same proportion during the last twenty years as in the United States, for many self-evident reasons. I have never seen any study showing the relative increase or decrease of land values, the relative burden of taxes, the proximate cause of a rise or fall of values therein, etc. Such a study would be difficult without appraising the economic, financial, social and speculative conditions in each country.

To Make the Tenant Tax-Conscious

One phase of the English system of assessment worth commendation and emulation, if constitutionally possible here, is the imposition of the local real estate taxes so largely in England on the occupier of the premises. One of the reasons for the great increase and burden of the realty tax in the United States is the fact that occupiers of rental property in America do not feel the burden of tax impositions. They generally are not tax-conscious. If this could be brought about in the United States, it would prove a long step to correct the mounting bill of taxes, voted and approved so largely by an unthinking electorate.

Whether England is any more successful in following and compelling her large moving population to pay than are the States in following the delinquent owners, is worthy of investigation. The present conditions are abnormal, of course; more so perhaps in the United States than in England. It would be peculiar if in ordinary times the owners of property, almost one to a family on the average in the average American city, were not a better risk than the tenantry of our older European countries, where tenantry predominates and where ownership of the fee is far less prevalent.

JOHN A. ZANGERLE,
Auditor of Cuyahoga County, Ohio.

EDITORIAL NOTE.—If Mr. Zangerle's proposal for making tenants tax-conscious could be carried out, there would undoubtedly be less unthinking approval of municipal and county expenditures—but whether the thinking thus stimulated would be intelligent or not would depend on the extent to which tenants were made not merely tax-conscious, but socially and civically conscious. A knowledge not only of the amount of the tax bill, but of what the tax bill buys in safety, sanitation, education and other public services, is obviously essential to an intelligent public opinion.

Subsistence Homesteads Projects

Aiming to Provide, Not Merely a Living, But a Life Worth Living

WITH the approval in recent weeks of Federal loans for eight different subsistence homesteads projects, this important new experiment, implemented with $25,000,000 NIRA funds, is definitely under way. Proponents of the idea are very hopeful that an important contribution to the nation's welfare and to rational land-planning will result from the development of these communities where agriculture and industry and government may combine to provide not merely a living but a life worth living.

As explained in Circular No. 1 of the Division of Subsistence Homesteads of the Department of the Interior:

"Underlying the enactment of this legislation is the widely held belief that large numbers of the population of this country face a period of employment difficulties so severe and prolonged that special measures of much more than an emergency relief character are required to deal with the situation. The unexpected duration of the depression forcefully emphasized the existence of basic weaknesses in our economic and social structure which had been developing for some time as a result of the planless, unguided national development of the past, and served also to call attention to markedly changed and, in some cases, new factors which can only be brought under control through a conscious policy of national planning. . . . The planned distribution of population contemplated in the subsistence homesteads legislation is essential in order that large groups of people, caught in a situation from which they are powerless to extricate themselves unaided, may have an opportunity to gain for themselves some degree of economic security and a more adequate standard of living."

Decentralization of Industry

In studying the application of these broad principles, we may first see how they affect large population centers.

From varying causes and to varying degrees, certain industries have been shifting their locations in recent years; perhaps to the rim of existing industrial centers, or to smaller municipalities within the same general industrial region, or to other centers in different industrial regions. This redistribution of the overbalance of population offers definite economic and social advantages, some of which might be developed in associating garden homesteads with work in nearby industrial plants. The Division Subsistence Homesteads, while not actively aiding industries to try out such experiments, is much interested in the possibilities.

Elimination of Rural Slums

Thousands of farm families are trying to make a living on useless or worn-out lands, or are viewing a hopelessly disorganized agricultural system. Completely demoralized, these country people move to the cities and there add to unemployment and relief problems. The reorganization and rehabilitation of such dislocated rural communities can be greatly aided by the Division of Subsistence Homesteads, in cooperation with other agencies. Of this work the circular says:

"The poor lands should be put into forests or grass or other vegetative cover, and the farm families given a chance to get out of the rural slums on to better lands where they will have an opportunity to become self-supporting and to achieve a decent standard of living. The poor lands which they leave should be zoned against resettlement, or other measures adopted to insure that other families will not repeat the same tragic and costly experience. . . . Of the better lands, however, there are large areas on which the traditional systems of growing staple crops like cotton and wheat on plantations or other large business units on a highly commercial basis have been made economically obsolete, apparently, by fundamentally changed economic conditions.

"Smaller farms, more compact grouping to permit the operation of schools, local government and other public services at lowest possible costs per capita, reduction of acreage of wheat and cotton and other staple crops, and more dependence upon subsistence crops, encouragement of ownership and reduction of tenancy, are among the changes that reorganization requires. Such reorganization may in turn necessitate a readjustment of local government functions and revenues, replanning of roads and schools, and other rearrangements."

Social Aims

Besides the economic benefits of this legislation, definite social gains may be made. For many years there has been a movement to suburban and village living, to which the automobile, the hard-surfaced highway, and the electric power line have given impetus. Suburban garden homes for workers, and the shorter work-day and work-week, would add to the comfort and joy of living. Land-use planning, engineering, low-cost housing, conforming to standards of sanitation,

Some Real Patching Going on Here!

Don't risk theft and loss of tools by using a make-shift wooden box. Protect your tools—keep them in a Littleford All-Steel HanDeeBox. You can lock the box and leave it on the job knowing full well that all will be as you left it when you return.

Here is the perfect set-up for maintenance work on bituminous macadam streets and highways — penetration patch work with a Littleford Tar and Asphalt Kettle and Hand Spraying Equipment. One group of men prepares the road several feet ahead. Two men follow with the kettle; one of them sprays bituminous material on the patches, while the other man operates the hand crank. Material is applied under pressure and penetrates to bottom of patch—easy, effective, economical.

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convenience, durability, and attractive design, will help to restore a morale undermined by long unemployment and dependence on relief.

Demonstration Projects

The fund of $25,000,000 made available to the Division of Subsistence Homesteads is directed toward preventing or reducing to a minimum future need for relief. With it, 10,000 families can be aided if the cost of subsistence homesteads can be kept to an average of $2,500. The Division is therefore helping to establish demonstration projects to test the practicability of various types under different conditions in different places, thus pointing the way to a program of permanent character. There are five major classes of projects:

1. Workers' garden homesteads near small industrial centers to which there is likely to be further decentralization.
2. Workers' garden homesteads near large industrial centers not likely to decentralize.
3. Rehabilitation of "stranded" industrial groups, particularly bituminous coal miners.
4. Reorganization of disorganized rural communities, and elimination of rural slums.
5. Moving population from dry-farming lands in the West to unoccupied farms on Federal reclamation projects.

From 25 to 100 or more families will form a subsistence homestead group, supplementary to work in office or factory. On the individual homestead the family will be expected to raise animal and vegetable food for their own use and not for sale, and to this end home processing and storage of food products will be encouraged. Home and small local industries will be fostered to aid in supplying clothing and other necessities. Full consideration will be given to projects for Negroes and other racial groups.

Up to January 20, 1934, subsistence homestead projects were under way, or had been approved by Director Wilson, in Dayton, Ohio, Decatur, Ind., Reedsville and Tygart River Valley, near Elkins, W. Va., Monmouth County, N. J., Youngstown, Ohio, Mount Pleasant Township, Pa., Birmingham, Ala., five Mississippi cities—Meridian, Hattiesburg, Laurel, McComb, and Tupelo, and in Pender County, N. C.

The Pender County project merits special mention, for it will mean the consummation of a "farm city" vision conceived several years ago by Hugh MacRae, of North Carolina, widely known for his efforts in building rural communities, and John Nolen as planner.

Probably the most significant discussion of the aims and ideals of the subsistence homesteads movement which has yet appeared is an article by Ralph Borsodi in the January, 1934, *Survey Graphic*, describing the first project to receive a Federal loan—the Dayton Homestead Unit, organized in the spring of 1932. The method of financing is explained, and the national implications of this first unit are made clear. It is stated that Dayton "may be the first city which will have developed the idea on a scale large enough to enable the country to determine its effects upon industrial and city conditions." That the author—a leading advocate of the homestead colonization idea, appreciates the fundamental importance of retaining for the community the land ownership and land revenues, is evident:

"A feature of primary importance in the Dayton plan is the system of land tenure. Title to the land and the original farm buildings, used for community purposes, is vested in the Homestead Unit as a whole. Separate plots are then leased to each homesteader on annual terms fixed by the Unit in accordance with the relative desirability of each plot. Leases are automatically renewed each year, though there are provisions for terminating them at any time. If terminated by the Homestead Unit—as they may be for violations of the provisions of the lease—the buildings and improvements of the plot may be sold by the homesteader or disposed of, if he fails to find a purchaser upon an appraisal determined by arbitration. On the other hand, the homesteader has title to all improvements upon his plot, and may sell his property at any time to any one eligible to become a member of the Unit.

"In other words, title to land rests in the community which creates the land value, and title to improvements in the individual. Under this system the holder of a plot is practically compelled to use it or abandon it to some one else who will. This, I believe, obviates the danger which has wrecked innumerable idealistic communities as well as real estate developments—the danger that the original owner will merely leave the plot unused awaiting an opportunity to sell it at a profit after an increase in value.

"The ground rents collected from the leaseholders furnish the community the income with which to pay taxes levied upon the property, interest payments, payments upon the principal borrowed in order to purchase the land, and any other community expenses."

Projects are being planned and organized under the general supervision of the Division and in cooperation with state agricultural colleges, experiment stations, and extension services; relief, welfare, and other state and local agencies whose services will be valuable. A maximum of local initiative and responsibility is involved, and the best technical experience and information available will be used. M. L. Wilson is the Director of the Division. John Nolen is Special Consultant.

The Federal funds advanced will be loans, not grants, and these loans will be made, not to individuals directly, but only to local corporations or other responsible agencies, organized specifically for subsistence homesteads purposes. Full information may be obtained from the Division of Subsistence Homesteads, Department of the Interior, Washington, D. C. The legal agency for facilitating the development of most of the homestead projects is the Federal Subsistence Homesteads Corporation, recently organized under the laws of Delaware.

Recent City Manager Appointments

E. C. ALEXANDER was appointed City Manager of Elizabethton, Tenn., on January 15, to succeed John A. Smith.

V. L. Allen, former Mayor of Sherrill, N. Y., on January 1 succeeded Frank C. Woglum as City Manager of Sherrill.

Harold W. Baker, for two years Director of Public Construction for the District of Columbia, recently succeeded Theodore C. Briggs as City Manager of Rochester, N. Y.

L. V. Bean, City Manager of Waycross, Ga., for the last six years, resigned to become City Manager of Paducah, Ky., on January 1.

C. H. Bischoff, former City Manager of Rumford, Maine, succeeded Harry H. Freeman as City Manager of Asbury Park, N. J., on January 16.

Harry A. Brinkerhoff, who served as City Manager of Portland, Maine, from 1923 to 1928, became the first City Manager of South Portland, Maine, on January 2.

M. S. Couch was reappointed City Manager of Daytona Beach, Fla., to succeed Charles S. Thrasher, who resigned his position on January 1.

Theodore Kluemper, former City Commissioner, was recently appointed City Manager of Covington, Ky., to succeed H. D. Palmore.

Pearl A. Lewis was appointed City Manager of Springfield, Ohio, on January 10, to succeed Ralph E. Garvin.

H. O. Miller has succeeded L. T. Nein as City Manager of Middletown, Ohio.

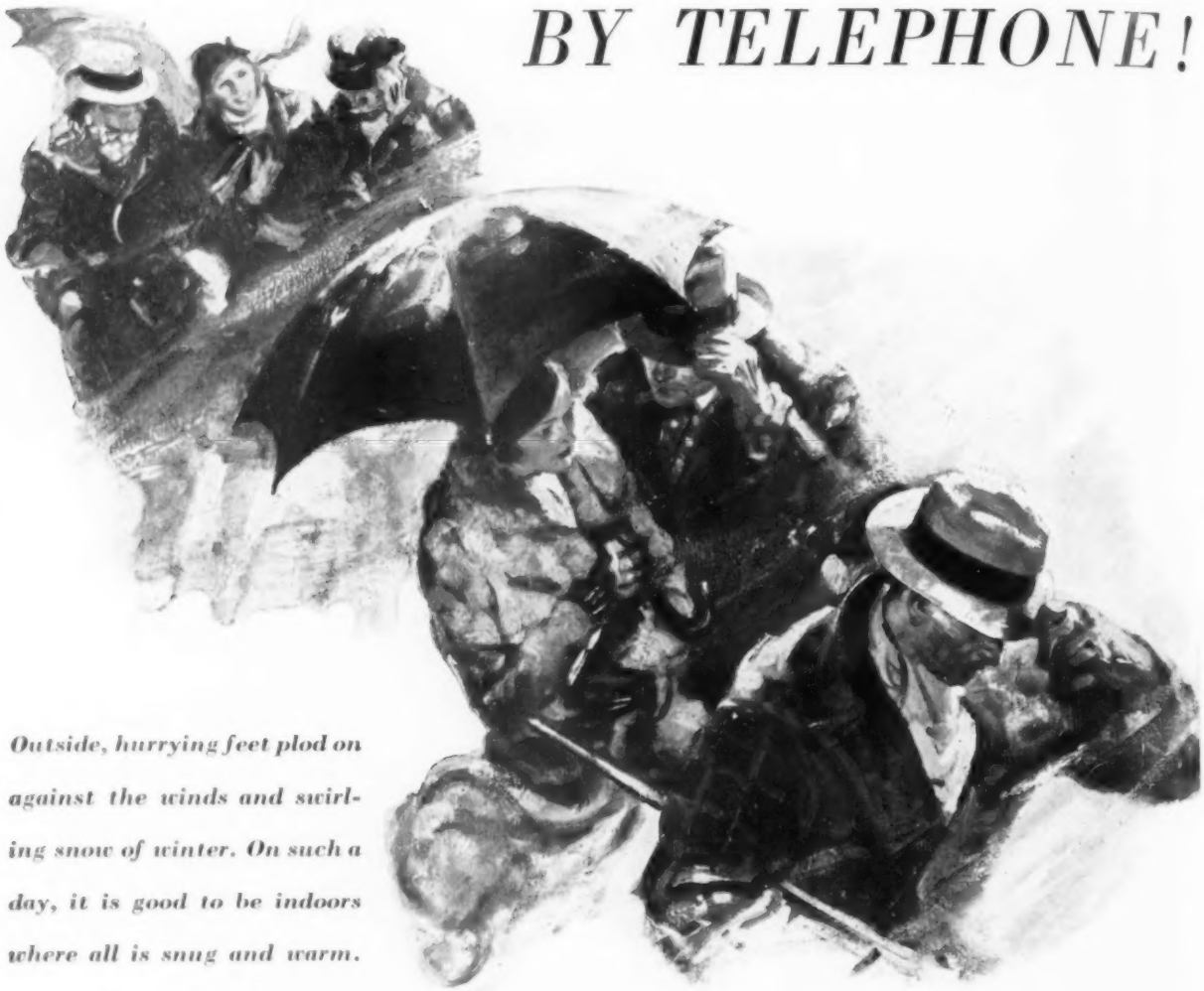
C. F. Sharpe, executive assistant to the City Manager of Cincinnati, Ohio, for the last four years, has been appointed City Manager of St. Petersburg, Fla., to succeed W. M. Cotton.

Florence Sullivan, for six years head of the Department of Refuse Collection and Disposal in Elmira, N. Y., was recently appointed the first City Manager of Elmira.

R. K. Wagar, former County Surveyor, on January 1 succeeded C. Webb Sadler as City Manager of Sandusky, Ohio.

CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

BUT IT'S FAIR AND WARM BY TELEPHONE!



Outside, hurrying feet plod on against the winds and swirling snow of winter. On such a day, it is good to be indoors where all is snug and warm.

• • •

ALL outdoors may be frowning, the thermometer close to zero, street travel an exhausting task. Yet to your telephone it is as clear and fair as a day in June.

Without moving from your chair at home or in your office, you can send your voice across the snow-swept miles. Wind and weather need not delay the necessary tasks of business or break the ties between friends and relatives. Through all the days of the year, the telephone is your contact with the world beyond your door. It knows no season—no letting up when the going gets hard. Through storm and flood, an army of trained employees works ceaselessly along the highways of speech.

This very day, as you talk so easily from the warmth and comfort of your home, a lineman may be scaling a pole far out on a frozen mountainside—so that the service may go on. So that you may talk to almost anyone, anywhere, at any time.

Make someone happy these winter days through a voice visit by telephone. A boy or girl at school, a mother or father in another city, or a good friend away on a visit. To most places 175 miles away, for example, the rate for a station-to-station call is 95c in the daytime, 85c after 7 P. M., and 55c after 8:30 P. M.

BELL TELEPHONE SYSTEM

Items of Municipal and Civic Interest

Strengthening Utility Regulation in New York State

THE state of New York, an early pioneer in public utility regulation, is today a stage where new and important acts in the long drama of struggle for effective utility control are occurring. Many actors are taking part—governor, legislature, commissions, courts and corporations.

Governor Herbert H. Lehman has sponsored eleven bills relating to public utilities. One of them would give to municipalities generally the right to own and operate electric and gas plants, upon approval by the local authorities and the voters—this being one instance where New York has lagged, although despite the lack of this general power there are over fifty municipal electric establishments in the state. Grouping of municipalities, and service to rural consumers, are also permitted. Municipal distribution of power to be generated at the St. Lawrence River by the State Power Authority is expected to be facilitated as one result of the bill.

Another proposed law permits the Public Service Commission to assess against a public utility the Commission's expense in investigating or valuing that utility, within the annual limit of 0.5 per cent of the utility's annual operating revenue. The Commission is authorized by another bill to put into effect temporarily reduced rates yielding 5 per cent on the original cost of a utility's property, less accrued depreciation. Other bills increase the Commission's control over relations of holding companies with operating companies.

Eight of these bills were submitted without success to the Legislature last year; but it is hoped that better results will be achieved, particularly as the issue of utility influence in the Legislature has been given effective publicity by W. Kingsland Macy, the new Republican party Chairman, who has not spared his own party; and the actions of Republicans and Democrats alike, as to utility measures, will be closely watched.

Meanwhile the Public Service Commission, under the leadership of Chairman Milo R. Maltbie, has ordered various emergency rate reductions, based upon the financial ability of the companies to ease the consumers' burden at a time of great public distress. In the case of the New York City electric companies the reduction ordered, after a reasonable allowance for added NRA costs and taxes (but not the 3 per cent tax assessed by Congress on the companies themselves), was 6 per cent of the revenues, or some $9,000,000. Factors taken into consideration included the excess earnings over 6 per cent on the book value of property and on the common stock, and also the existence of over $200,000,000 in surplus and contingency reserves. As Chairman Maltbie inquired in his decision, "What is the purpose of a surplus or contingency reserve unless it is for use in emergency cases such as the present?"

This order still permitted earnings of 7½ per cent on the stated value of the common stock; nevertheless the companies rushed to an up-state judge and obtained an injunction. Although the reduction ordered by the Commission was for one year only, it seems likely that the year will pass without the reduction taking effect. Nevertheless the attitude of the electric companies and the ruling of the Court may help to bring about the passage of the Governor's program of legislation.

H. M. OLMSTED.

To Make the Dirt Fly on Sound Housing Demonstrations

EVIDENCING the rapidly growing determination of civic leaders throughout the United States to rid our cities of unsafe, insanitary dwellings, and to provide decent housing for the lower-income groups,—and to do it through public agencies where private initiative cannot or will not act,—the National Public Housing Conference held an all-day session in Washington on January 27 with an attendance of 350 from 15 cities.

Speakers representing the Federal Government included Mrs. Franklin D. Roosevelt, Secretary of the Interior Harold L. Ickes, Robert D. Kohn, Miss Grace Abbott, Frederic H. Howe and Isador Lubin.

The following resolutions were adopted:

(1) As an immediate and permanent policy, we urge the creation of public housing authorities in states having the necessary enabling legislation, and the passage of such legislation in states which are now without it.

(2) In states where public authorities do not now exist or cannot immediately be legally created, we urge that demonstrations be started at once by the Public Works Emergency Housing Corporation as the most effective means of educating communities in the possibilities of slum clearance and decent low-cost housing for wage-earners, and as an important aid to solving the unemployment problem.

(3) We are in hearty sympathy with President Roosevelt's statement to a committee of this conference this afternoon, that the most effective step in the housing program for the immediate future is to make the dirt fly on sound demonstrations.

(4) We are convinced that this action will do more than anything else to assure the future of public housing and to secure increased appropriations from Federal and other governmental funds. If the money already appropriated is wisely and speedily spent, additional appropriations will certainly be forthcoming.

(5) The members of this conference pledge themselves vigorously to initiate in their own communities such action as may be necessary to achieve the objectives set forth above.

The National Public Housing Conference has its headquarters at 112 East 19th Street, New York. Mrs. Mary Kingsbury Simkhovitch is President; Herbert Bayard Swope, Treasurer; and Miss Helen Alfred, Secretary.

"Reviving Local Government" on Nation-Wide Broadcasts

ANNOUNCEMENT is made by the Committee on Civic Education by Radio that the seventh series of "You and Your Government" discussions will be broadcast on the nation-wide network of the National Broadcasting Company on Tuesday evenings, February 13 to June 19 inclusive. The hour, as heretofore, will be 7:15 to 7:45 P.M., Eastern Standard Time. The general theme will be "Reviving Local Government." The February and March programs follow:

FEBRUARY 13.—The State and Local Government
Governor Herbert H. Lehman, New York
Prof. Thomas H. Reed, Chairman, Committee on Civic Education by Radio

FEBRUARY 20.—NEW YORK CITY BLAZES THE TRAIL
Mayor Fiorello H. LaGuardia, New York City
George H. Hallett, Jr., Secretary, Citizens Union of New York.

FEBRUARY 27.—FINANCIAL PROBLEMS OF NEW YORK CITY
Miss Pearl Bernstein, Secretary, Board of Estimate
W. Arthur Cunningham, Comptroller
Bernard S. Deutsch, President, Board of Aldermen

MARCH 6.—NEW YORK CITY'S BUSINESS ACTIVITIES
Paul Blanshard, Commissioner of Accounts
R. E. McGahen, Director of the Budget
Joseph D. McGoldrick, Deputy Comptroller

MARCH 13.—SOCIAL PROBLEMS IN NEW YORK CITY
Miss Loula D. Lasker, Associate Editor, The Survey
William Hodson, Commissioner of Public Welfare
Langdon Post, Tenement House Commissioner

MARCH 20.—OHIO FORGING AHEAD
R. C. Atkinson, Director, The Ohio Institute
Leyton E. Carter, Director, Cleveland Foundation
W. M. Cotton, Assistant Director, Cincinnati Bureau of Municipal Research

MARCH 27.—IMPROVING LOCAL GOVERNMENT IN NEW JERSEY
Governor A. Harry Moore, New Jersey
Thomas N. McCarter, President, New Jersey Public Service Corporation
Charles P. Messick, Chairman, State Planning Board

48 Years in City Engineering

To the Editor of THE AMERICAN CITY:

I note in your January issue an article in regard to M. E. Gustin, who served the city of Lebanon 45 years in several different capacities. You ask that others having served a long term with municipalities state their time of service.

I have served the city of Battle Creek for nearly 48 years in the capacity of the head of a department or more than one. My work has been almost entirely in connection with water works and sewers, although I did some work in other lines.

I constructed the original water works and sewerage systems of this city and have been engineering about sixty years in railway and city work. When a young man I was City Engineer of Erie, Pa., for a little over four years.

W. W. BRIGDEN,
Superintendent and Engineer, Department of Public Works.

Battle Creek, Mich.
January 26, 1934.

Marston Avenue, Madison, Wisconsin. Tarvia-built in 1910, the year Glenn Curtiss flew from Albany to New York to win a $10,000 prize. Upper photo was taken in 1920; lower photo shows the road today. After 24 years of ever-increasing traffic, it is in first-class condition.

Barrett Tarvia
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	Bethlehem	Rochester	Portland, Me.	

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More Effective Fire Prevention

FROM "Fire Prevention Practices in New York State Municipalities," an exceedingly valuable report by DeWayne E. Nolting, published recently under the joint auspices of the New York State Conference of Mayors and the School of Citizenship and Public Affairs of Syracuse University, the following conclusions and recommendations are quoted:*

THE fire loss of over 1 1/3 million dollars per day for the last 13 years is a financial drain upon every individual. Seventy-five per cent of this loss is preventable through more extensive organization of bureaus of fire prevention in municipal fire departments, and more intensive individual concern. Considerable more emphasis should be diverted from the fire fighting to the fire prevention function.

General

The average loss due to unknown causes in municipalities having bureaus of fire prevention is approximately 50 per cent of that of other municipalities.

Direct financial fire loss—the usual measurement of losses from fire—shows only a part of the true loss. The annual direct loss may be multiplied by 3 to include the cost of insurance service and fire departments. Other indirect and intangible losses are more difficult to estimate.

Although 11 of the 16 cities in New York of over 40,000 population have bureaus, only 3 of the 98 municipalities between 40,000 and 5,000 have definite bureau organizations.

Adequate fire records are seriously lacking in many fire departments not having bureaus of fire prevention.

The chief of the fire department in many municipalities should sense more keenly his responsibility as community leader in fire prevention education.

Fire insurance is a semi-public utility, and rates should be investigated to determine their reasonableness. The chief executive of the municipality should take the initiative in this matter.

Fire departments without bureaus of fire prevention or organized fire prevention work are spending thousands of dollars to fight fires, but not one cent to prevent them from starting. The average cost of bureaus of fire prevention in the state is only 2.3 per cent of the fire department budget.

More reliable measurements and comparisons of municipal fire losses are possible through the use of both the per capita and the $1,000 assessed valuation methods.

All municipalities should, by local action, provide individual liability for the cost to the city of extinguishing fires due to negligence, carelessness, or non-compliance with fire department orders.

Efforts should be made to make people "fire conscious" or to think fire prevention.

The state law requiring fire prevention education in the schools should be enforced.

*See page 80 of the January issue.

Municipalities, in cooperation with the fire insurance agencies, should seriously consider the problem of over-insurance.

Bureau Organization and Personnel

The chief of the bureau of fire prevention should be a fire prevention engineer. A mechanical engineer with executive ability should qualify for this position after a short period of training in the fire department.

In cities from 200,000 to 400,000 population the chief of the bureau should be assisted by another engineer, who is also a statistician, to analyze and solve the technical problems of the fire department. Cities over 400,000 population should have a technical division composed of several engineers. These men should make liberal use of charts, graphs and spot maps to aid them in their prevention efforts.

The inspection division of a bureau should consist of enough full-time uniformed inspectors to cover the business and industrial districts four times each year. Roughly, the minimum requirement is one inspector per 40,000 population. These men should be chosen for their technical training and ability. As men with these qualifications may not be found in all fire departments, the qualifications may be required of new recruits.

The arson squad of a bureau should consist of two full-time investigators in cities from 150,000 to 350,000 population. One should have had several years' experience in fire fighting. The other should be a detective detailed to the bureau. These men may assume arson duties as part-time work in cities under 150,000 population, while the number should be doubled in cities from 350,000 to 700,000 population.

One clerk will usually be sufficient in cities from 40,000 to 300,000 population. In municipalities under 40,000 population it may be possible for the clerk of the fire department to assume these duties, while in cities from 300,000 to 700,000 population two full-time clerks will probably be necessary.

In municipalities under 20,000 population, responsibility for fire prevention may be placed in one full-time technical man. He would be assisted part-time by other members of the department. This minimum bureau organization in the fire department is preferred to the consolidation of fire prevention work with the bureau of buildings.

Additional Bureau Functions Recommended

All dwellings should be inspected by regular firemen once each year as a means of eliminating hazards and educating the public in fire prevention. This would supplement the work of the full-time inspectors of the bureau.

Since approximately 25 per cent of the annual fire loss is due to arson, suspicious fires should be investigated more fully, and the public educated as to the seriousness of the crime.

Records of losses paid by the fire insurance companies should be obtained, as fire department estimates alone are sometimes unreliable and misleading.

A uniform classification of fire causes is urged in order that annual trends may be observed and municipal records compared.

For State Action

The Model Arson Law should be enacted to replace the present inadequate State Arson Law.

The state law requiring fire prevention education in the schools should be enforced. The fundamentals of fire prevention may easily and lastingly be impressed upon the minds of children.

For Municipal Legislation

Every city and first-class village should have a comprehensive fire prevention code giving power to officers and providing technical regulations for hazards.

Wooden shingle roofs should be prohibited within the city limits—not merely the fire limits.

All municipalities should pass an ordinance providing individual liability for the cost to the city of extinguishing fires due to negligence, carelessness, or noncompliance with fire department orders.

1933 Fire Losses Show Substantial Reduction

THE preliminary estimate by the National Fire Protection Association, of the fire loss in the United States for the year 1933, is $318,200,000. This amount is based on estimates compiled by the National Board of Fire Underwriters for the eleven months ended November 30, 1933, with a figure for December based upon loss experience for the same month in previous years adjusted for the loss trend of the current year. The total estimate indicates the lowest annual aggregate loss recorded in fourteen years.

The fire loss for 1932 was $406,885,959; for 1931, $451,643,866; and for 1930, $501,980,624. The 1933 fire loss brings the total fire waste of the United States during the past eighteen years up to the stupendous sum of $7,988,452,556, an annual average of approximately 440 million dollars.

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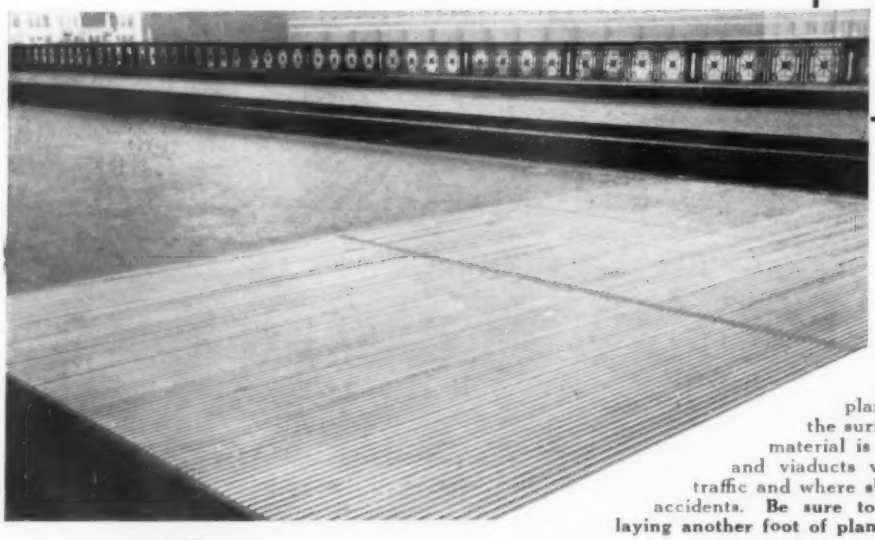

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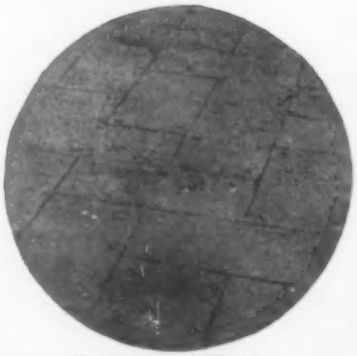
SEMENTREAD

SEMENTREAD is a new skid-proof planking—one which can be guaranteed skid-proof—when laid horizontal to the traffic it promptly stops the forward motion of the car, and when laid vertical to the traffic it stops the side skid as well as forward skidding. SEMENTREAD comprises a cement rib keyed in the asphalt plank surface, which adds rigidity to the surface also making it skid-proof. This material is especially adapted on city bridges and viaducts where wet days are a menace to traffic and where short skids are dangerous and cause accidents. **Be sure to learn about this product before laying another foot of planking!**

Guaranteed Skid-Proof



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Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Garage—Residential District

NEW YORK.—*B. and L. Enterprises, Inc., v. Schneider* (Supreme Court, Westchester County), reported in *New York Law Journal*, December 30, 1933.—Under the zoning ordinance of the city of Mount Vernon only private garages may be erected in a "Residence B" or apartment district; such garages must be constructed in a special way, and no business, service or industry shall be carried on, or gasoline, oil or other volatile material stored, sold or handled therein. The defendants claim that the ordinance is unreasonable and void because the regulation of construction is more onerous than that governing the construction of public garages. But, in the opinion of the Court, garages erected as accessory to apartment houses ought to be more carefully regulated than public garages. Built in connection with buildings in which a large number of families may be housed, the fire hazard is great and the precautions against fire should be correspondingly great.

The defendants also claim that the ordinance is unreasonable because cars cannot be serviced, and tenants are thereby inconvenienced. But, the Court ruled, servicing is a business, and the city of Mount Vernon had the right to exclude business from a residence district, as it has done.

Zoning — Garbage Disposal Plant

NEW YORK.—*O'Brien v. Town of Greenburgh* (Appellate Division), reported in *New York Law Journal*, December 23, 1933.—In this action the plaintiffs, who are property owners and householders in the town of Greenburgh, seek an injunction to prevent the town from erecting a garbage disposal plant, including a garage for ten trucks to be used in the business, on property situated in a residence zoning district. This property was purchased by the town for the purpose of erecting such an incinerator on it. Under the zoning ordinance of the town neither a garbage disposal plant nor a commercial garage can be erected in the district. The town is authorized by the state law to collect and dispose of garbage and operate a plant or incinerator for its disposal.

The Court found that such a plant is undesirable in a residential district; that there are many districts in the town zoned for industrial purposes; that the plans and specifications for the proposed plant are in accord with the best engineering principles, and it may not be determined in advance of the construction that the contemplated plant will be a nuisance. The Court holds that in its contemplated action the town will be exercising not a governmental function, mandatory upon it, but a municipal or corporate function, in exercise of its private rights. The Court therefore decides that the Legislature of the state did not intend to give the town the right to violate, to the great injury of certain of its citizens, the terms of its zoning ordinance, also enacted by virtue of the authority of the state. The town is therefore enjoined from erecting the incinerator on its property situated in a residential zoning district.

EDITOR'S NOTE.—The general question whether the local government passing a zoning ordinance under a state law is authorized, under any other general or special provision of state law, to disregard its own ordinance is entirely a question of the interpretation of the laws of the state in question. Undoubtedly laws could be framed under which the local government would, or would not, have this right. The same is true with regard to the action of one local government within the limits of another local government.

The weight of what little authority there is on the general question is to the effect that the state and its agencies are not bound by such limitations couched in general terms, as in this case; but only by limitations which are express or arise from the words of the statute by necessary implication. The decisions to this effect are given in a note to this case in a lower court, to be found in our issue of March, 1933.

The novelty in this case is in making the decision turn upon the question whether in erecting the incinerator the town of Greenburgh would be exercising a governmental or a corporate function. The distinction is a difficult one to make. The collection of garbage is a function in the interest of public health, often exercised by public authorities. This function is not usually profitable to the public authority as such, greatly as it benefits the community. The care of the sick and insane is surely for the general welfare, and is done sometimes by the public authorities, sometimes by private agencies for private profit.

It may be of interest to note in this connection that under the Federal Constitution Congress has power to exercise exclusive legislation in all cases whatsoever over all places purchased by the consent of the legislature of the state in which the same shall be for the erection of needful buildings. In such cases the Federal jurisdiction has been said to be exclusive. Whether this broad statement is subject to any qualifications has not, so far as your editor knows, ever been decided. As a rule, public authorities must act with due discretion and in good faith.

It should be noted that the decision in this case is by a court inferior to the Court of Appeals. The decision of that court, the highest in the state, is awaited with great interest.

Undertaking Establishment

TENNESSEE.—*City of Memphis v. Qualls* (Court of Appeals, Western Section, March 24, 1933), 64 S. W. 2d, 548.—The use of a residence in a commercial district for the display and sale of caskets, no funerals to be conducted therefrom, and no vehicles to carry bodies in or out, or to enter from the street in question, is not a nuisance, or obnoxious or offensive, within the meaning of the zoning ordinance; and a permit for such use is rightly granted.

EDITOR'S NOTE.—Evidently the premises were to be used not as an undertaking establishment in the ordinary meaning of that term, but as a salesroom.

Boards of Appeal, Police Power, Front Yards, etc., in Los Angeles

The annual Report of the City Planning Commission of Los Angeles for 1932-1933 contains many things of interest, brought out by comments upon it in a letter to the President of the City Planning Commission by Edward M. Bassett, in which Mr. Bassett said in part:

"On page 11 the difficulty of obtaining a Board of Appeals is referred to. Your legal advisers may be right about the need of a constitutional amendment, but it would seem to me that, if your state can have a public service commission or a railroad commission with power to fix rates under the rule of reasonable rates, it would also be allowable to appoint a Board of Appeals under a state permissive law giving such board the power to make variances in zoning in cases of practical difficulty and unnecessary hardship. . . . The great benefit of a Board of Appeals is that it easily carries disputed matters into court by certiorari and there is a judicial determination with an opportunity for appeal to the highest court. This method does away with spot zoning and all of its drawbacks. The people of this city would no more give up their zoning plan than they would give up their subway system.

"As you well know, Illinois and Maryland have not acceded to the words 'practical difficulty and unnecessary hardship' (*Welton v. Hamilton*, 344 Ill. 82, 176 N. E. 333; *Jack Lewis, Inc., v. Mayor and City Council of Baltimore* [Md.], 164 Atl. 220). Elsewhere in the United States these words seem to constitute a sufficient rule, for they are universally used in the state enabling acts except on the Pacific Coast."

In connection with the second paragraph quoted, your editor wishes to call attention to the amendments to the Illinois zoning enabling act of June 28, 1921, which went into force July 1, 1933. These amendments were passed to overcome the constitutional objection to the law of 1921, there referred to. They give the power of variance, with certain qualifications, to the legislative bodies of Illinois cities and villages.

It is regarded by many students of zoning as important that the allowance of such variances should be reviewed by the courts in order that those who issue them should be held down to a careful observance of law and justice, and the discretion which must be used in such cases kept within reasonable limits. There can be no such review of legislation, and if the legislative body exercises its power of variance in its legislative capacity, the courts cannot pass upon the reasonableness of its action. Local legislative bodies, however, may act in an administrative capacity and be subject to court review.

In what capacity does the Illinois Legislature intend that the local legislatures of that state should act in this matter, and does the law of that state provide for court review? These questions your editor will not attempt to answer at this time. It is interesting to note, however, that a somewhat similar provision of law in New Jersey has been held to give the courts this right of review. The case in which this was decided is *Fonda v. O'Donohue*, and a note on that case will be found in this department for February, 1933.

FORD V·8 TRUCK PRICES REDUCED

New lower first cost has now been added to low cost of operation and low cost of maintenance

NOW for the first time an 8-cylinder, 75 horsepower truck is available for as little as $500. The Ford V-8. The truck that has proved itself in actual service—proved its power, speed, stamina and economy.

Economy of operation and up-keep is one of the outstanding features of the Ford V-8 engine. Most "8's" have been big engines, designed for use in heavy, expensive units. But the Ford V-8—compact, simple, easily and inexpensively serviced—has shown that high power can be had at very small cost. The records of thousands of owners establish remarkably low figures not only for gasoline and oil consumption but for service and repairs. It is the most economical Ford engine ever built.

The new low prices add another important economy factor. Today, more than ever, the Ford V-8 is the logical truck to help your business show a profit. The nearest Ford dealer is ready to help you select the Ford unit best suited to your business.

V-8 TRUCK
131½" WHEELBASE

	NEW LOW PRICE	REDUCTION
Chassis	$500	$36
Stake	665	36
Platform	650	26
Std. Panel	750	26
De Luxe Panel	780	31

V-8 TRUCK
157" WHEELBASE

	NEW LOW PRICE	REDUCTION
Chassis	$520	$46
Stake	730	36
Platform	690	36
Std. Panel	860	36

V-8 COMMERCIAL CAR
112" WHEELBASE

	NEW LOW PRICE	REDUCTION
Chassis	$360	$10
Pick-up	470	10
Std. Panel	550	10
De Luxe Panel	565	15
Sed. Delivery	565	5

Prices f. o. b. Detroit. Front bumper now included as standard equipment on 131½" and 157" wheelbase

FORD MOTOR COMPANY

Ford

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held not liable for motorist's collision with unlighted safety island if street railroad company neglected to maintain lights but city was not apprised that such neglect would occur (Georgia Court of Appeals: *Butler v. City of Atlanta*, 170 S. E. 539).

Town held not liable for injury to prisoner because of unsanitary condition of jail (Virginia Supreme Court of Appeal, *Franklin v. Town of Richland*, 170 S. E. 718).

Claim for injury to pedestrian, giving time and place of accident and nature of injury, but not specifying cause, held insufficient to sustain action against city (Connecticut Supreme Court of Errors, *Nicholaus v. City of Bridgeport*, 167 Atl. 826).

Annexation

Statutory annexation of unbenefited lands to city held void (Florida Supreme Court: *State v. City of Largo*, 149 So. 420).

Annexation upheld although some land was uninhabited, etc. (California District Court of Appeal: *People v. City of Whittier*, 24 Pac. 2d, 219).

If reasonableness of annexation is debatable municipal decision precludes judicial interference (Missouri Supreme Court: *State v. City of Joplin*, 62 S. W. 2d. 393).

Appointments

City Commission held entitled to reconsider appointment of Clerk although he had taken official oath (Michigan Supreme Court: *Thorne v. Squier*, 249 N. W. 497).

Bonds

Statute permitting refunding of improvement district bonds, with interest and expenses, held valid (Arkansas Supreme Court: *Benton v. Nowlin*, 62 S. W. 2d, 16).

Bondholder held entitled to compel municipal officials by mandamus to make provision for payment of bonds (Florida Supreme Court: *State v. City of Ft. Pierce*, 149 So. 338).

Civil Service

Civil service provisions of charter held applicable to operation and maintenance of public works, but not to day labor used in construction work (Washington Supreme Court: *Butchek v. Collier*, 24 Pac. 2d, 619).

Condemnation Proceedings

Landowner's suit for damages held to bar later suit by him challenging right to condemn. City held entitled to trees, etc., on land condemned for public use (Massachusetts Supreme Judicial Court: *Barnes v. Peck*, 187 N. E. 176).

Contracts

Contract for light plant materially varying from town's specifications held invalid for want of competitive bidding (Iowa Supreme Court: *Iowa Electric Light & Power Co. v. Incorporated Town of Grand Junction*, 250 N. W. 136).

Mayor, who was also manager of utility company, held not "interested" in such sense as to invalidate company's contract to sell electric energy to city (Washington Supreme Court: *Mumma v. Town of Brewster*, 24 Pac. 2d, 438).

Municipal proceedings concerning contract held properly shown by extraneous evidence when record was silent or imperfectly kept (Florida Supreme Court: *Ramsey v. City of Kissimmee*, 149 So. 553).

Elections

Statute may make council judge of election, etc., of its members, but aldermen involved in contest are disqualified to vote on question and mayor has no veto power. Court could not control by injunction mayor's rulings on motions (Texas Court of Civil Appeals: *Robinson v. Hays*, 62 S. W. 2d, 1007).

Finances

Mandamus held properly issued against city to compel payment of warrant issued for municipal supplies (Georgia Supreme Court: *City of Abbeville v. Eureka Fire Hose Manufacturing Co.*, 170 S. E. 23).

Statute authorizing city to issue general obligation bonds to redeem local improvement bonds, payable only out of special assessments, held not mandatory (Washington Supreme Court: *Buell v. City of Toppenish*, 24 Pac. 2d, 431).

City held powerless to incur liability for light and water plants without providing annual tax to discharge same (Idaho Supreme Court: *Straughan v. City of Coeur D'Alene*, 24 Pac. 2d. 321).

Health Measures

Charter power to preserve public health held to support ordinance regulating barber business (Virginia Supreme Court of Appeals: *Ransome v. Craft*, 170 S. E. 610).

Intoxicating Liquors

Ordinance forbidding manufacture, sale or transportation of liquor sustained under general power to provide for good government of village (New York, Broome County Court: *People v. Coulides*, 265 N. Y. Supp. 765).

Licenses

City held entitled to limit number of licenses to sell cigarettes (Iowa Supreme Court: *Ford Hopkins Co. v. Iowa City*, 248 N. W. 668).

Municipal Powers

Town held not authorized to sell crushed stone to contractors, although same was produced by beneficiaries of emergency relief (New York Supreme Court, Jefferson County: *Tooly v. Town of Wilna*, 266 N. Y. Supp. 177).

Municipal Stadiums

Statute authorizing construction of municipal stadium upheld (South Carolina Supreme Court: *Cathcart v. City of Columbia*, 170 S. E. 435).

Municipal Utilities

City held empowered to develop electric power as incident to increasing water supply (Massachusetts Supreme Court: *Barnes v. Peck*, 187 N. E. 176).

Ballot in election on question of erecting light plant held sufficient, although not giving details (Iowa Supreme Court: *Hogan v. City of Corning*, 250 N. W. 134, and *Wyatt v. Town of Manning*, 250 N. W. 141).

Water-works bonds payable out of net revenues of plant held not to create such debt as required electoral assent under constitution (New Mexico Supreme Court: *Seward v. Bowers*, 24 Pac. 2d, 253).

Official Publications

Weekly paper published by clerk of council held to contain sufficient news to constitute it a "newspaper" eligible for official publications (Ohio Supreme Court: *State v. Urner*, 186 N. E. 706, overruling decision in *Bising v. City of Cincinnati*, 184 N. E. 837, cited THE AMERICAN CITY, October, 1933, p. 71).

Sewers

Front-foot assessment against entire property held improper where sewer covered only part of frontage (Pennsylvania, Court of Common Pleas, Lancaster County: *Elizabethtown v. Measheу*, 25 Pa. Munic. Law Rep. 39).

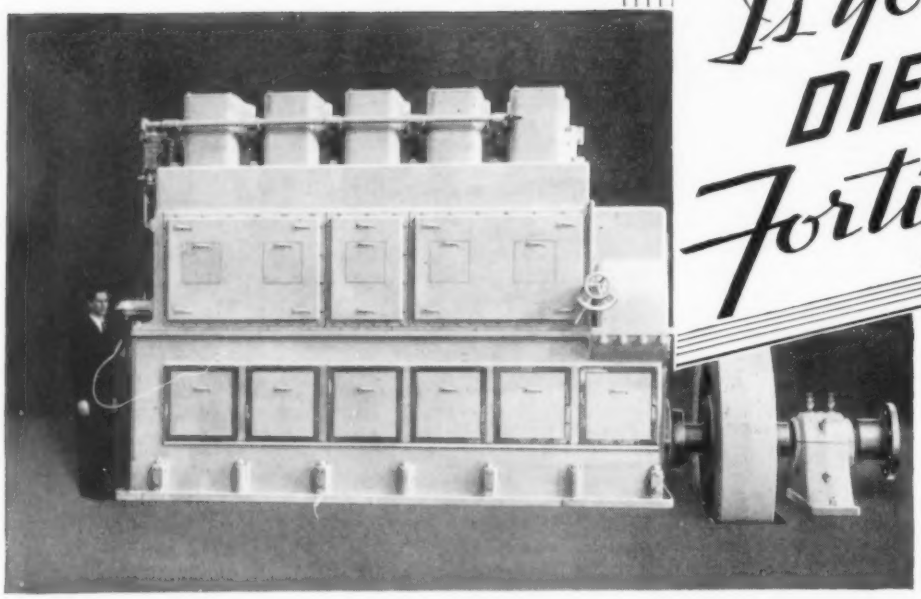
Streets and Alleys

Ordinance forbidding sale of goods, etc., on streets, alleys, etc., upheld (Pennsylvania Court of Common Pleas, Somerset County: *Commonwealth v. Vance*, 24 Pa. Munic. Law Rep. 12).

Taxation

Ordinance attempting to exempt private office building from taxation held invalid and not validated by curative statute (Alabama Supreme Court: *City of Anniston v. Anniston Office Building Co.*, 149 So. 93).

Council's attempt to reduce tax assessment held invalid as amounting to an unauthorized gift of public funds (New York Supreme Court, Oswego County: *Oswego Falls Corporation v. City of Fulton*, 265 N. Y. S. 436).



Standard M & S Mechanical Injection, 5 Cylinder, 625 H. P., Fully Enclosed Diesel Furnished in Capacities from 150 to 1600 H. P. and Up

Is your City DIESEL Fortified?

MODERN cities still fortify . . . not with walls . . . but with fine McIntosh & Seymour Diesel engines . . . against excessive electric light and power costs.

It is not enough to say that in hundreds of municipalities and industrial plants M & S Diesels are employed exclusively . . . that they reduce rates to consumers and save for industry. For in city after city these M & S prime movers pay actual profits back to the community . . . profits that meet other expenses and reduce taxes.

Our twenty years devoted exclusively to the designing and refinement of Diesel engines enables us to bring to you guaranteed mechanical performance . . . but more than that, to offer also exceptional plant layout and engineering experience—to meet your particular power needs . . . most economically.

If you have a lighting, water or power problem . . . large or small . . . we can help you "fortify" against excessive costs—help you put it on an earning basis.

A CHECK-UP AND A RESULT

Seven years ago Rockville Center, Long Island, N. Y., faced the inevitable necessity for supplying electric power at less cost to home owners and industry.

An exhaustive investigation among Diesel equipped municipal plants pointed to McIntosh & Seymour as the wisest choice. The progressive record of M & S Diesels since purchased speaks for itself...

Year	Each
1927—two 6-cyl. Diesels,	1250 H.P.
1927—one 4-cyl. Diesel,	480 H.P.
1930—one 6-cyl. Diesel,	1250 H.P.
1932—one 8-cyl. Diesel,	2856 H.P.

As a RESULT this plant has...

- reduced its rates to consumers far below any previous figure;
- returned in full its investment in the M & S Diesel engines;
- paid for many city improvements;
- built up a large power profit reserve.

Rockville Center is typical of many M & S municipal installations on which we will gladly furnish detailed figures.

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M & S—LARGEST EXCLUSIVE MANUFACTURERS OF DIESEL ENGINES

MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated

Local Government

City Management—The Cincinnati Experiment.—By Charles P. Taft. Farrar & Rinehart, Inc., New York. VIII + 275 pp. $2.50 from THE AMERICAN CITY.

The author of this thrilling account of a municipal "reform" movement of continuing vitality is the Chairman of the Men's Organization of the City Charter of Cincinnati. The story begins in 1921, when the government of the city was exercised by the machine through the ward and precinct organization. Then came the Cincinnatus Association, and, in 1923, recognition of Murray Seasongood's outstanding power of authentic statement in illuminating dark places; Henry Bentley's work for the Birdless Ballot, which would compel citizens to vote for men and not for the rooster or the eagle (known by his pants); then the organization of the City Charter Committee, and, in 1924, the decisive victory for a proportional representation, small council, city manager charter, and the arrival of a new day for Cincinnati, with the educational campaign which resulted in the victory won in the famous year of 1925. The chapter on proportional representation explains the method of election that brought about this triumph. The days since then are covered in nine enlivening chapters, in which many characters, events, and allusions hitherto vaguely noted in newspaper and magazine articles become clear. For the relief of dull hours, for the tearing away of cobwebs, and for the quickening of faith that local good government is a possibility in large cities, this book should be joyfully read.

An enlivening study of the quality of citizenship in Chicago and Cook County, Ill., has been made by George O. Fairweather, and has been published (January 1, 1934) by The University of Chicago Press in a 60-page pamphlet entitled "Wanted: Intelligent Local Self-Government—Restoring the Parties to the People." The author finds that the party system in local government as practiced stands in the way of intelligent citizen participation and criticism and gives rise to many complaints of conditions. Private advantages are its main incentive. It results in poor public service at high cost, in lowered morale, in civic apathy and distrust, and blocks any healthy growth of American democratic institutions. The recommended cure is: to change the present party system to the sort of instrument that will represent and register the informed will of the people; or to create a new party, or other mechanism, to do this. The discussion is detailed, direct and forceful. 25c. (Apply to the publishers, Chicago, Ill.)

"Civic Pittsburgh—Facts and Figures about Your Business" is a 16-page pamphlet prepared and published (1933) by J. C. Slippy, for over ten years Chief Accountant in the office of the Mayor of Pittsburgh. It covers, with text and charts, the organization and administration of the city, of the Board of Public Education, and of the county of Allegheny, and to the financial status of these three governmental units. 50c. (Apply to the author, 424 Third Ave., Pittsburgh, Pa.)

Fire Insurance

The bulletin—"Just a Moment ——"—published weekly by the Buffalo Municipal Research Bureau, Inc., takes up in its issue of January 18, 1934, the matter of fire insurance for the city's schools and other public buildings. The situation is stated to be this: "The city of Buffalo owns some $50,000,000 worth of schools and public buildings which are insurable, but at present, in the main, uninsured. Policies have been allowed to lapse and have not been renewed. Nor has any other plan for protection against a large fire loss been adopted." The danger is clearly presented; three available insurance methods and their costs are stated; and one of the plans is recommended for prompt adoption. 4-page folder. $1 a year. (Apply to the Bureau, White Bldg., Buffalo, N. Y.)

Land Values

One Hundred Years of Land Values in Chicago.—By Homer Hoyt. University of Chicago Press, Chicago. 519 pp. $5.00 from THE AMERICAN CITY.

A detailed statistical and analytical study of the amazing rise and fall of land values in Chicago during the last hundred years. The author finds five major cycles in the real estate history of the city. In each of these cycles a sudden increase in population preceded the rapid upturn in new construction and in land values. Population, however, is "not a final cause, but a symbol, for a complex combination of other forces," such as manufacturing and trading opportunities. A study of the cyclical phenomena reveals that subdivision activity is "the most sensitive and volatile measure of a land boom." The volume is of particular interest as it represents the first comprehensive study of land values in a large city over a long period of time.

Housing

The Proceedings of the National Conference on Low Cost Housing, which was held in Cleveland, Ohio, October 25-27, 1933, are published in a pamphlet of photo offset reproductions of 109 typewritten pages; editor, William Frear, and assistant editor, Theodore Wolfe. The presentation is definite and clear, and the cross-index to the material makes particular references quickly available. Elliott H. Whitlock was the General Chairman of the Conference. The papers give the ideas of some of our leading housing experts, arranged under five heads: General Consideration of Low Cost Housing; Standard Materials; Specific Types; Services for Low Cost Housing; Summarizing the Conference. $1.50. (Apply to the publishers, The Cleveland Engineering Society, Cleveland, Ohio.)

"State Laws for Public Housing" is a 20-page memorandum issued by the National Association of Housing Officials on the drafting of enabling acts for public housing agencies. Ernest J. Bohn is the President and Charles S. Ascher the Executive Director of the recently organized Association. The states of Maryland, Michigan, New Jersey and Ohio have passed laws creating housing authorities or other public housing bodies, and in 15 states there are laws creating boards to supervise private limited-dividend housing corporations. This memorandum frames proposals for state legislation involving a long-term program, consistent with the Federal policies for housing and slum clearance, but adaptable to change to meet new conditions. (Apply to the Association, 850 E. 58th St., Chicago, Ill.)

Auditing

"The Auditing of Municipal Accounts in New York State" is a study made by William A. Lafferty, Jr., under the joint auspices of the New York State Conference of Mayors and the School of Citizenship and Public Affairs, Syracuse University. It is publication No. 28 of the Bureau of Training and Research, New York State Conference of Mayors and Other Municipal Officials, Albany, N. Y. 83 pp. $1.00. The divisions include: Accounting Systems of Cities and First-Class Villages; The Auditing Work of Municipal Officials, in three chapters—Revenues and Receipts, Expenditures and Disbursements, Examination of Condition; The Work of Private Auditing Firms Hired by Municipalities; The Auditing Work of State Officers; An Auditing Program for Cities and Villages. (Apply to the Bureau.)

Licenses

A mimeographed reprint from the Revised Chicago Code of 1931 (with amendments to January 15, 1934, presents material from Sections 2062-2076 on "Wheels—(Vheicle) Tax Licenses," covering all the details of the city's control of "motor vehicles"—"propelled otherwise than by the muscular power of man or animal, except such as run on rails or tracks." (Send 13c in stamps to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

Police

Private Police—With Special Reference to Pennsylvania.—By J. P. Shalloo, Ph.D., University of Pennsylvania. Published by the American Academy of Political and Social Science, Philadelphia. 1933. IX + 224 pp. $2.50.

"The only satisfactory criterion of private police is *purpose*," says the author. "If their employment is for the extra protection of private property, for which compensation is made by the employer, they are private police in the sense used in this study." The divisions of the study are: Railroad Police; Coal and Iron Police; Private Detectives; and Private Patrolmen.

Planning

The twenty-fifth National Conference on City Planning was held jointly with the American Civic Association, at Baltimore, Md., October 9-11, 1933. Under the title, "Planning and National Recovery," the proceedings of the Conference have been published by Wm. F. Fell Co., Philadelphia. IV + 158 pp. $3.00. The general subject was presented under three sections: Planning and National Recovery; Large-Scale Regional and Rural Land Planning; Slum Clearance and City Planning: Authorities on the various problems involved gave the papers and took part in the discussion. (Apply to the Conference, 130 E. 22d St., New York.)

Water Works

The papers and discussions presented at the sixth annual meeting of the Pennsylvania Water Works Operators' Association, held at State College, Pa., September 7-9, 1933, are published in the 122-page Journal of the Association. The list of members is included, with their addresses. The subjects of the papers given at the meeting are: Trouble Papers (12 in number, on various subjects); Algae; Road Oils and Tars and Their Effect on Water Supplies; The Service of the Laboratory to the Water Purification Plant; Coagulation Plant; Filter Operating Experiences; Construction and Protection of Drilled Wells; Application of Fine Anthracite to Water Purification. (Apply to I. M. Glace, Sec.-Treas., 506 South Office Building, State Capitol, Harrisburg, Pa.)

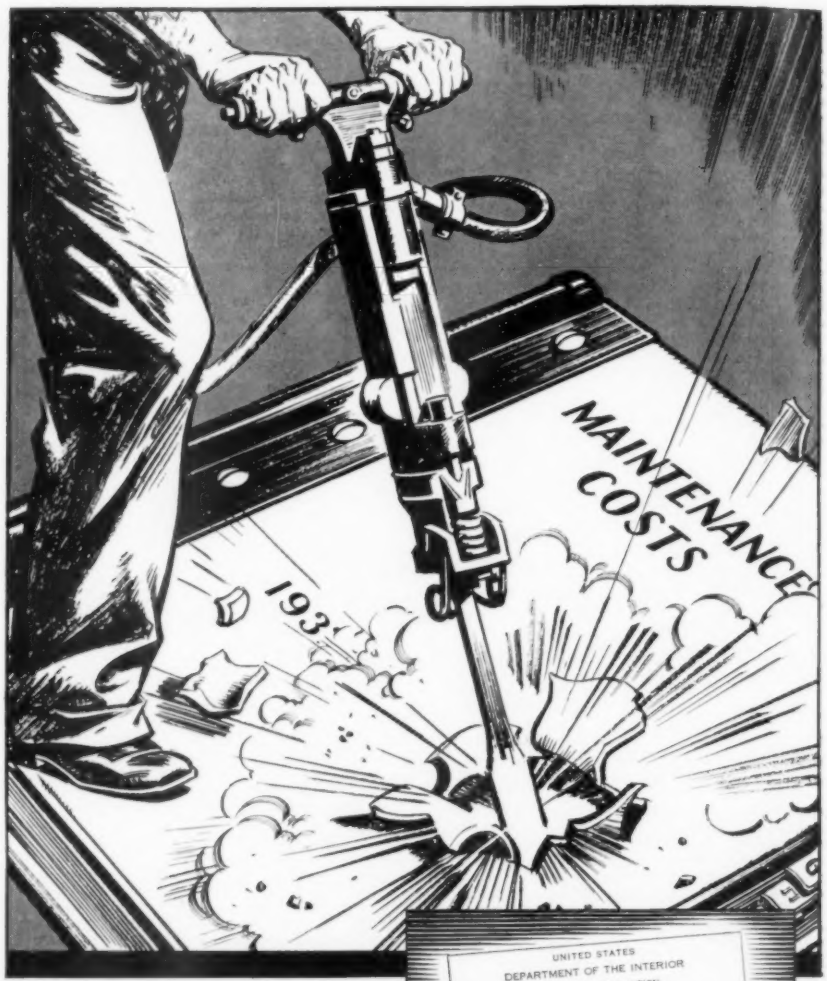
Public Works

The Union Internationale des Villes et des Pouvoirs Locaux, 3bis, Rue de la Regence, Brussels, Belgium, is continuing its distinguished service through the periodical review, *L'Administration Locale*. Its form is that of separate printed documents, 16 pages or less, in French, well illustrated, enclosed in a folder, permitting the filing of the material under various subjects. The issue of September-October, 1933, includes ten separate documents on: school architecture; air pollution; hospitals; training for nurses; the distribution of gas supply; public safety; public baths; sewage treatment; waste collection and disposal; and city planning. (Apply to the Union.)

Mendicancy

An organized movement to eliminate professional beggars from the streets of New York City, and to see that actually needy persons who ask alms are brought into contact with the private and public sources of relief that are open to them, has been announced by The Welfare Council of New York City (122 E. 22d St.). The Council's Committee on Mendicancy has suggested a plan to be carried out in cooperation with the Magistrates' Courts. This plan is fully explained in a 10-page mimeographed release (January, 1933) which may be obtained from the Committee at the address above. The Committee has received the wholehearted cooperation of the Civil Works Service Bureau, the Magistrates, the Police and Probation Departments, the welfare agencies, and the civic, trade and neighborhood associations. It is essential that the public support the plan by refusing money to beggars and panhandlers.

How to take a needless cost OFF YOUR BOOKS!



END the *needless* cost of replacing rusted service pipe. Install *copper* service tubing. Copper can't rust. It resists soil corrosion.

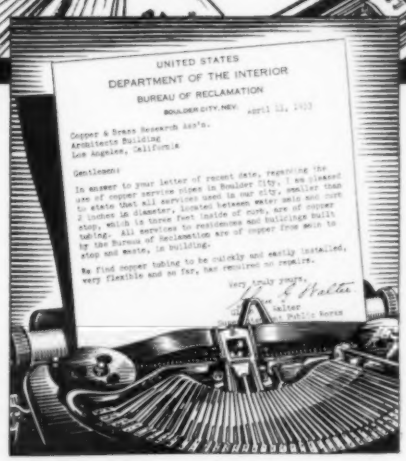
It's easy and economical to handle because it comes in long lengths or coils. Flexible copper tubing can easily be bent to form its own "goose-neck"—without the cost and trouble of making joints.

Because of its freedom from rust, copper service piping delivers a full flow of clean water from main to curb cock. Its lasting, efficient, economical qualities have resulted in its general specification in up-to-date codes and regulations.

Write us for information. The wide experience of our research engineers, covering all types of soil and water conditions, is at your service.

EVERY TIME that breaker rips into the pavement to replace a length of rusted-out service pipe, it leaves its mark on somebody's cost-records. Here's how one government department is going to avoid that cost:

WHAT ONE U. S. GOVERNMENT PROJECT DOES: Writing from Boulder City, Nev., Glen G. Walter, Supt. of Public Works, states: "All services to residences and buildings built by the Bureau of Reclamation are of copper . . . We find copper . . . so far, has required no repairs."


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
BOULDER CITY, NEV. April 13, 1933

Copper & Brass Research Ass'n.
Architects Building
Los Angeles, California

Gentlemen:

In answer to your letter of recent date, regarding the use of copper service pipes in Boulder City, I am pleased to state that all services used in our city, smaller than 2 inches in diameter, located between water main and curb stop, which is three feet inside of curb, are of copper tubing. All services to residences and buildings built by the Bureau of Reclamation are of copper from main to stop and waste, in building.

We find copper tubing to be quickly and easily installed, very flexible and so far, has required no repairs.

Very truly yours,
G. Walter
Supt. of Public Works

Copper SERVICE Tubing

COPPER & BRASS RESEARCH ASSOCIATION 25 Broadway, New York City

Liquor Control

The Committee on Liquor Control Legislation of the National Municipal League presents its report on "Liquor Control: Principles; Model Law" in the Supplement to the January, 1934, issue of the *National Municipal Review*. The resolution adopted by the League on November 11, 1933, is given by which the problem was outlined and a committee of 21 appointed. The "Principles Governing Liquor Control Legislation" are stated by the Committee, which urges the support of the State Liquor Authority Plan. Summaries of addresses at the November convention of the League are given: "Liquor Control from the Standpoint of a Toxicologist," by Yandell Henderson, Professor of Applied Physiology, Yale University; "After Prohibition What Form Should Liquor Control Take?", by Albert L. Scott, co-author of the report, "Toward Liquor Control"; "Quebec's Experience," by Walter G. Mitchell, K.C., father of the Quebec Liquor Control Law; and "Some Observations on Liquor Control," by Pierre S. du Pont, Liquor Commissioner of Delaware. A selected bibliography is given, and the remaining 16 of the 78 pages present the Committee's draft of a model law for establishing a State Liquor Control Authority. (Apply to the League, 309 E. 34th St., New York.)

Liquor Taxes

Bulletin No. 3 (January, 1934), *Taxbits*, of the General Welfare Tax League, deals with the question of revenue from the liquor traffic. The information is definitely and concisely presented under these heads: Confusion of Existing Legislation; License versus Monopoly; Recent State Legislation; Coordinating Federal and State Revenues; Federal Legislation; Revenue Estimates. The bulletin closes with extracts from an address on the Liquor Tax Program delivered by Luther Gulick, Director of the Institute of Public Administration, before the General Welfare Tax League, at Philadelphia, December 28, 1933. 6 mimeographed pp. 25c. (Apply to the League, 309 E. 34th St., New York.)

Law and Contemporary Problems

The Duke University School of Law has issued the first number (December, 1933) of a quarterly entitled *Law and Contemporary Problems*. It is recognized in this new undertaking that "legal" problems may have other classifications as well, and that representatives of other fields of study and activity may have knowledge and experience of value in solving these problems. The quarterly is therefore organized in symposium form, and plans to present contrasts and conflicts of opinion without seeking a balance between them. The first issue is devoted to various discussions of "The Protection of the Consumer of Food and Drugs." Single copies, 60c; yearly subscription, $2.00. (Apply to the School of Law, Duke University, Duke Station, Durham, N. C.)

Sociology

"Studies in Urban Sociology" is a pamphlet of 157 pages which represents the results of the main studies of various urban problems of Omaha made by T. Earl Sullenger, Ph.D., Professor of Sociology and Director of the Bureau of Social Research at the Municipal University of Omaha. Distribution of this collection of studies is being made by the Bureau. Universities and study clubs of all kinds have found this material useful. Among the subjects considered in relation to Omaha, with broad application, are intra-urban mobility, youth and the movies, mothers' pensions, juvenile delinquency in relation to outdoor relief, the urban play group, divorce, the Negro, the immigrant, school non-attendance and truancy, the crime situation, the migratory child, and the social life of a neighborhood. Maps, charts and many tables. A mimeographed bibliography for urban sociology accompanies the pamphlet. (Apply to the Bureau of Social Research, The Municipal University, Omaha, Nebraska.)

Ports

"Port of Milwaukee" sets forth impressively, in 20 quarto pages, with folding map, the description, history, and facilities of the harbor of Milwaukee. Many illustrations help to emphasize the advantages of this harbor. (Apply to the Board of Harbor Commissioners, Milwaukee, Wis.)

Revenues

"Charges Made by Cities for Minor Highway Privileges" is the title of Report No. 39 issued, November, 1933, by the United States Conference of Mayors, Drexel Ave. and 58th St., Chicago, Ill. 36 mimeographed pp. Forty-four American cities make charges for minor highway privileges, thus regulating these uses of the streets and gaining revenue therefrom. The privileges include sidewalk vaults, overhanging signs, awnings, fire-escapes, balconies, cornice projections, canopies, and other construction. The information given in the report is tabulated by cities; also alphabetically by uses in four cities—Baltimore, Milwaukee, New Rochelle, and Chicago, with ordinances, and other information. (Apply to the Conference.)

Ordinances

A mimeographed copy of "What Our City Councils Are Doing" will be loaned to libraries by the Municipal Reference Library of Chicago, Ill., for copying. It is List No. 27 of references to ordinances introduced in or passed by the city councils of large cities, and is dated December 7, 1933. The ordinances are classified alphabetically as to subjects—from Advertising, and Animals, to Vehicle Pounds, and Vital Statistics. (Apply to Frederick Rex, Librarian.)

Finance

The U. S. Bureau of the Census has published regarding Indiana, Rhode Island, and Virginia pamphlets giving in each case a "Digest of State Laws Relating to Taxation and Revenue: 1932"; compiled with relation to statistics of taxation and revenue published by the Bureau in connection with the Decennial Report on Public Indebtedness, Valuation, Taxation, and Expenditures; also, for the same states, "Financial Statistics of State and Local Governments: 1931"; covering revenue receipts, governmental-cost payments, public debt, assessed valuations, and tax levies for the government of the state, counties, cities and towns, school districts, and townships. Each 5c. (Apply to Superintendent of Documents, Washington, D. C.)

Schools

The Report of the Governor's School Survey Commission, New Jersey, is published in two volumes: I, "School Costs and Economies in the State of New Jersey"; II, "Reconstruction of the System of Public School Support in the State of New Jersey." 79 and 169 pp., respectively. Illustrated. December, 1933. Tables, charts. As the titles indicate, the report gives, in Vol. I, a survey of school costs and potential economies, and treats of certain weaknesses in administration and organization aspects of school finance in the state; and, in Vol. II, the results of the Commission's investigation into the adequacy of the basic structure of school finance in New Jersey. (Apply to the Commission, Trenton, N. J.)

Housing — Parkways — Roadsides

The Architectural Record for December, 1933, presents a wealth of finely illustrated material, among which are the following articles: Federal Housing Corporation to Hasten Slum Clearance; The Nation Plans for Recreation (from an address by Administrator of Public Works Harold L. Ickes); Modern Motor Ways, by Gilmore D. Clarke, Landscape Architect, Westchester County (N. Y.) Park System; Park Recreation Areas in the United States; Roadside Cabins for Tourists. Single copy, 50c. (Apply to the magazine, 115-119 W. 40th St., New York.)

Employment Stabilization

The Employment Stabilization Research Institute of the University of Minnesota is distributing a bulletin entitled "Commercial Correspondence Courses and Occupational Adjustments of Men," prepared by Charles Bird, Associate Professor of Psychology, with the assistance of Donald G. Paterson, Professor of Psychology, in the University. February 1, 1934. 27 pp. 50c. The study is based upon a careful analysis of men registered in the Employment Stabilization Research Institute who had participated in commercial correspondence courses, and is an effort to aid in answering the questions (and other connected queries): Is it true that individuals who have taken correspondence courses thereby protect themselves against the hazard of unemployment? (Apply to The University of Minnesota Press, Minneapolis, Minn.)

Traffic

The Erskine Bureau of Street Traffic Research, Harvard University (Miller McClintock, Director), has issued a "Street Traffic Bibliography" giving a selected and annotated bibliography of the literature of street traffic control and related subjects, 1920-1933, prepared and published under a grant of the Harvard University Committee for Research in the Social Sciences from the funds of the Rockefeller Foundation. The divisions of the list are: General Works; Accidents and Accident Prevention; City and Regional Planning with Special Reference to Relief of Traffic Congestion; Streets and Highways; Intersections; Parking and Garaging Problems; Traffic Laws and Regulations; Administration and Enforcement; Traffic Signals, Signs and Markings; Street Traffic Surveys, Reports, Counts and Censuses; Mass Transportation and Its Relation to Street Congestion; Automobile Insurance and Taxation. The final chapter (XIII) contains biographical notes on some of the more prominent contributors to the literature of traffic engineering, administration, and related subjects. 223 mimeographed pp. $1.00. (Apply to Joseph Wright, Librarian of the Bureau, Harvard University, Cambridge, Mass.)

The Massachusetts State Department of Public Works has issued in its Traffic Bulletin for October, 1933, a tentative draft of "A Standard Municipal Traffic Code," prepared for comments, suggestions and criticisms. 33 multigraphed pp. (Apply to Arthur W. Dean, Chief Engineer of the Department, 100 Nashua St., Boston, Mass.)

The "Uniform Traffic Code for the City of Chicago" has been published in the form of a handy booklet which may be obtained from the Municipal Reference Library, 1005 City Hall, Chicago, Ill., upon remittance of 1½ cents in stamps for mailing. The Code was passed by the City Council July 30, 1931, and is presented as amended up to and including July 11, 1933.

Accident Prevention

In a forceful and attractive pamphlet of 24 pages entitled "Auto Accidents Can Be Reduced" the National Safety Council sets forth the great cost of traffic accidents, in human life and in money, and shows how cities have reduced this appalling loss. "Only by a thoroughgoing plan which includes adequate engineering, effective law enforcement, and sound public education have automobile accidents ever been permanently reduced. . . . The program must be balanced, *and it must not end*." The making and using of graphic accident records—"spot maps" and collision diagrams reveal to the traffic planner the cause of repeated accidents in a given place, and make it possible to apply the remedy and check its results. The adoption of signs and signals that mean the same, respectively, wherever located; understandable, enforcible ordinances and regulations; enough, well-trained traffic policemen; intelligent accident investigation; one traffic court in the city, with a consistent judge; and effective safety education;—these are important elements of the accident prevention program. The pamphlet is well illustrated. (Apply to the National Safety Council, 20 N. Wacker Drive, Chicago, Ill.)

Social Welfare

A report on "Welfare Administration in New York State Cities," by Hugh R. Jackson, has recently been issued under the joint auspices of the New York State Conference of Mayors and Other Municipal Officials, and the School of Citizenship and Public Affairs, Syracuse University. It is Publication No. 26 of the Bureau of Training and Research, of the Conference. 180 pp. 33 charts and tables. Many forms, of various kinds. $1.50. Twenty municipal welfare departments in the state were visited by the writer and furnished the material on which most of the descriptions of procedures and the conclusions drawn are based. Reports from 28 other cities were also analyzed and used. The divisions of the study are: The Extent of the Problem; Department Organization; Application and Investigation; Qualifications and Training of Personnel; Department Relief Policies; Care of the Single Man, Records and Reports; Relationship of Home Relief to Work Relief. (Apply to the Bureau, Albany, N. Y.)

...From Every Section, the Records always "Check"

BALTIMORE—"Now take our Chase Street! We built it of brick in 1902. It has carried metropolitan traffic 32 years and is good for another generation at least." (See unretouched photo below).

MARTINSVILLE, IND.—"The same is true of our Main Street. It carries Dixie Highway travel. We built it in 1901—it's in excellent condition and *we've never spent a dime* repairing it."

THE MOST INEXPENSIVE PAVEMENT IS BRICK...WHEREVER RECORDS ARE KEPT, THAT FACT IS PROVED AGAIN AND AGAIN

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The utmost value is always had from brick pavements. In all sections of America—and the world—you will find brick pavements serving 30 or more years without trouble and without expense.

The reason is simple. Whereas most pavements can take traffic wear, few can withstand weather. *Weather does not affect brick.* They do not crack and disintegrate from excessive temperature changes. They do not spall from moisture absorption. Their acknowledged claim to permanence is established by their performance in actual use.

At this time when many are rectifying extravagances and erroneous conclusions of the past few years, why not revalue the facts about all pavements? How have the various types lived up to the claims of their sponsors made 10 or 15 years ago? The paving brick industry invites you to check the claims and performance of brick pavement records along with all others.

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This year finds a big program of construction in full swing. Employment of labor is an important objective. More men are employed in the construction of brick pavements—which serves the needs of *today.* Brick pavements cost far less in the long run—which serves the needs of *tomorrow.*

For further information write National Paving Brick Association, National Press Building, Washington, D. C.

BRICK PAVEMENTS PUT MORE MEN TO WORK SAVE TAXPAYERS MONEY

Public Finance

Chapters in Public Finance.—By Paul Studenski. Reprinted from Volume II of Economic Principles and Problems, by Walter E. Spahr and others. Ray Long & Richard R. Smith, Inc., New York. 1933. 162 *pp.* 75c.

A scholarly treatment of expenditures, revenues and public credit. The author holds that maximum social advantage is obtained when public expenditures with the greatest net utility are made first and the others follow in order, and when the net utility of the marginal unit of expenditures equals the net disutility of the marginal unit of taxes. An increase in public expenditures is not necessarily an evil. On the contrary, it is more likely to be a benefit. Whether it is the one or the other depends upon what it secures for the community by comparison with what the same amount would have been used for if left to be spent in private hands. Government is a productive, wealth-creating organization just as is private enterprise.

The burdensomeness of taxation cannot be judged by any simple formula. It is necessary to take into account the amount of taxes; the community's income (which reflects also its wealth); the share which taxes directly or indirectly take of the people's income; the proportion of taxes put back into the pockets of the taxpayers as interest on bonds and like payments; the utility of the public services produced from taxes in relation to the utility of private expenditures; the distribution of taxes in relation to incomes; as well as other factors.

Mechanical devices for the limitation of public expenditures often fail to prevent extravagance and waste. They are too rigid and in frequent cases are evaded or else prevent socially desirable expenditures. Improved administration, intelligent public opinion, a closer adjustment of tax rate and debt limits to actual conditions, and the displacement of war by peaceful methods of adjusting international disputes, appear the most promising means of securing greater efficiency and economy in public expenditures.

MABEL L. WALKER.

Roadsides

In *The Roadside Bulletin* for January, 1934, there is some particularly noteworthy material entitled "Connecticut Leads in Its Roadside Development; Needs Greater Regulation." It is the report of a survey originated and largely financed by the Federated Garden Clubs of Connecticut, during which Mr. and Mrs. W. L. Lawton, of the National Council for Protection of Roadside Beauty, covered 2,400 miles on the highways of the state. Many photographs obtained are herewith reproduced and show glaring contrasts between beauty and "slums" on Connecticut highways. It is stated that the information secured in the survey will form the basis of a vigorous campaign until the Connecticut Legislature meets in 1935, when an adequate law for billboard restriction will be sought. 15 pp. The *Bulletin* is published by the American Nature Association, 1214 16th St., N. W., Washington, D. C., for the National Council for Protection of Roadside Beauty, 119 E. 19th St., New York. (Apply to the Council.)

Recreation

The title "Youth Never Comes Again" immediately brings the thought that there is something to be done about providing play, work, fun, health, and happiness in years that should be enthusiastically remembered by and by. Miss Clinch Calkins has written a handbook which is published by The Committee on Unemployed Youth (450 Seventh Ave., New York), giving recreational and educational programs that will attract CWA funds in sustaining the morale of unemployed youth. The "cautions of procedure" outlined in this pamphlet alone would make it worth while. There is a quality of understanding, a compelling vigor, a picturesqueness of presentation that tends to enlist action. The compilation of suggestions is called by the author "scattered and insufficient," but it deals with things that are actually being done to answer the cry: "I am young and I am a person, and this happens to be my time to live in the world." 71 pp. (Apply to the Committee.)

Water Supply

Abstracts on water supply are published monthly by the Water Pollution Research staff of the Department of Scientific and Industrial Research, 16 Old Queen Street, Westminster, S.W.1, London, England. These abstracts form a summary of current literature on the subject. The January, 1934, issue contains material under the following divisions: Water Supplies; Analysis and Examination of Water; Sewage; Trade Waste Water; Pollution of Natural Waters; and Miscellaneous. 36 pp. 2s. net. (Apply to the Department.)

Publications Nos. 108 and 109 (1933-1934) from the Harvard Engineering School, Cambridge, Mass., are: "On the Determination of Odors and Tastes in Water," by Gordon M. Fair, Associate Professor of Sanitary Engineering, Harvard University, reprinted from the September, 1933, *Journal of the New England Water Works Association*, 35 pp.; and "Fundamental Factors Governing the Streamline Flow of Water Through Sand," by Associate Professor Fair, and Loranus P. Hatch, Research Fellow in Sanitary Engineering, Graduate School of Engineering, Harvard University, reprinted from the November, 1933, *Journal of the American Water Works Association*. 15 pp. (Apply to the Harvard Engineering School.)

Other Reports Received

CHICAGO, ILL.—Annual Report, Department of of Public Works, 1932. 388 pp. (Send 15c in stamps to Municipal Reference Library, 1005 City Hall.)

LOS ANGELES, CALIF.—Annual Report, Board of Public Works, year ending June 30, 1933. 165 pp.

ROANOKE, VA.—Anuual Report, Chamber of Commerce, 1933. 23 pp.

UPPER DARBY TOWNSHIP, PA.—Annual Report, Highway Department, 1933. 14 mimeographed pp.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

FEBRUARY 5-8.—NEW YORK. (200)
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York.

FEBRUARY 8.—BOSTON, MASS. (100)
Massachusetts Highway Association. Annual meeting. Secretary, John M. McCarthy, 11 Lincoln Street, Natick, Mass.

FEBRUARY 13-15.—ANN ARBOR, MICH. (600)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 14-16.—ATLANTIC CITY, N. J. (1,000)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, Secretary, State Highway Commission of New Jersey, Trenton, N. J.

FEBRUARY 19-22.—CHICAGO, ILL. (250)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 20-22.—TORONTO, ONT. (300)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

FEBRUARY 24—MARCH 1.—CLEVELAND, OHIO. (10,000)
National Education Association—Department of Superintendence. Annual meeting. Executive Secretary, Sherwood D. Shankland, 1201 16th Street N. W., Washington, D. C.

MARCH 1-3.—KNOXVILLE, TENN. (100)
American Water Works Association—Kentucky-Tennessee Section. Annual meeting. Executive Secretary, F. C. Dugan, 532 West Main Street, Louisville, Ky.

MARCH 7-8.—PHILADELPHIA, PA.
American Water Works Association—Four States Section. Annual meeting. Secretary pro tem., Theodore V. Wood, 2600 Girard Trust Co. Building, Philadelphia, Pa.

MARCH 22-23.—TRENTON, N. J. (200)
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

APRIL 10-12.—AUGUSTA, GA.
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

APRIL 4-6.—TORONTO, ONT. (300)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, A. E. Berry, Ontario Department of Health, Parliament Buildings, Toronto 5, Ont.

APRIL 20-21.—BILLINGS, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 30—MAY 1.—BOSTON, MASS.
New England Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 30.—GREENWICH, CONN.
New England Sewage Works Association. Spring meeting. Secretary, F. W. Gilcreas, Room 409, 14 Beacon Street, Boston, Mass.

MAY 1-4.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, A. D. Skinner, 1615 H Street, N. W., Washington, D. C.

MAY 3-4.—WASHINGTON, D. C.
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

MAY 14-17.—ATLANTIC CITY, N. J. (500)
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 24.—NEW YORK.
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

JUNE 4-8.—NEW YORK. (12,000)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

JUNE 14-15.—GREEN BAY, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

JUNE 25.—SALT LAKE CITY, UTAH.
American Legislators' Association. Western Bus and Truck Conference. Executive Director, Henry W. Toll, Drexel Avenue and 58th Street, Chicago, Ill.

JUNE 25-27.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

AUGUST, SECOND WEEK OF.—RICHFIELD, UTAH. (300)
Utah State Municipal League. Annual convention. Secretary-Treasurer, P. K. Nielsen, Price, Utah.

AUGUST 23-24.—WHEELING, W. VA.
American Water Works Association—Central States Section. Annual convention. Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

SEPTEMBER 3-6.—PASADENA, CALIF.
American Public Health Association. Annual meeting. Acting Executive Secretary, Kendall Emerson, 450 Seventh Avenue, New York.

SEPTEMBER 17-19.—SANTA FE, N. MEX. (100)
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

SEPTEMBER 24-28.—CLEVELAND, OHIO.
American Transit Association. Annual convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

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Trinidad Lake Asphalt Cold Mixtures are prepared with the same grades of stone, sand or other mineral aggregate and Trinidad Lake Asphalt used since 1876 in the construction of standard types of Trinidad hot-mix pavements.

Trinidad is the safest asphalt for durability. Trinidad cold-laid pavements have a high coefficient of friction and are safe for modern traffic.

Trinidad Lake Asphalt Cold Mixtures are used for new construction . . . for resurfacing . . . for maintenance. Trinidad Lake Asphalt Cold Mixtures are convenient . . . can be laid with hand tools or mechanical devices immediately after preparation, or from stock piles.

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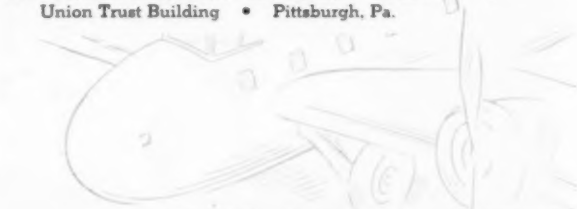

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

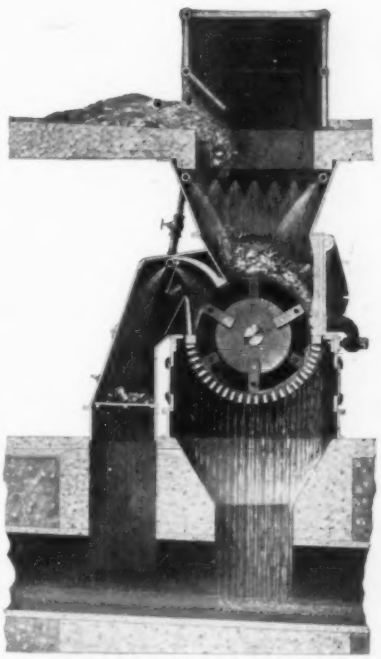
Mineral-Surfaced Asphalt Bridge Plank

Asphalt plank as a bridge surfacing has many distinctive characteristics which set it apart from other types of material. It will not warp, crack, splinter or decay, and, being resilient, it will stand considerable vibration and deflection. It is strong, durable and practically wear-proof, and knits and heals under traffic. Another outstanding advantage is the fact that it can be applied quickly and easily and is ready for traffic as soon as it is laid. Asphalt bridge plank is especially suited to two general types of bridge construction. In cases involving wearing surfaces only, the subfloor and structure not being revised, asphalt bridge plank, compared with other types of material, is better adapted, wears longer, is much lighter in weight and is easily applied with simple tools and local workmen. On new work, or on old bridges where the floor system must be reconstructed or the trusses strengthened, asphalt bridge plank permits a wider choice of designs. Light-weight asphalt bridge plank often makes wood decks entirely feasible when otherwise a more expensive construction might be required. In conjunction with specially constructed steel decks, asphalt plank combines an ideal wearing surface with great strength and striking economy.

J-M mineral-surfaced asphalt bridge plank, made by Johns-Manville, 22 East 40th Street, New York, provides for the first time a bridge surface with all the inherent advantages of the older smooth surface plank and with the outstanding additional feature of greatly improved traction when wet. Should some unusual condition result in injury to some portion of the bridge, it is a very simple matter to replace only the affected slab and obtain, without securing special machinery for mixing or applying, a job as good as when the entire surface was first laid. There are no unsightly patches when asphalt bridge planks are used. Asphalt bridge plank is not subject to abrasion, being of fibrous character, and has no tendency to grind off under traffic, so that an asphalt bridge plank floor remains dustless. The waterproof quality of asphalt bridge plank affords a quick run-off and rapid drying after a rain.

The Disposal of Green Garbage with Sewage

To many municipalities the disposal of garbage is a troublesome and expensive problem, resulting in the development of a number of widely different methods. As a means of disposing of green garbage with a minimum of effort and expense, The Jeffrey Manufacturing Co., Columbus, Ohio, has developed the



A CROSS-SECTION OF THE JEFFREY GREEN GARBAGE GRINDER

Jeffrey green garbage grinder. In this machine green garbage can be ground to a pulp so finely divided that the particles will settle in water, and the pulped garbage is passed on to discharge into a stream or into the local sewage system. Green garbage contains 50 to 90 per cent moisture, which is released as free water by the beating and reducing process of the grinder. Water thus released insures free movement of the garbage through the sewers. The plant required for the grinding of the garbage can be small and inexpensive. A small town can frequently install one small plant, while larger cities may use a number of the small units conveniently located in different sections, thus eliminating long hauls. The grinding plants can be kept odorless by flushing with water, and the cost for grinding per ton is very low.

Green garbage is dumped on the sloping concrete floor from the collection trucks. Sorters pick out inorganic materials such as tin cans, brickbats, silverware, etc., and then push the garbage through the hinged doors and into the hole in the floor, through which the garbage drops into the grinder, which reduces it to finely divided pieces. Water from spray pipes installed in the feeding hopper above the grinder flushes the reduced garbage through the grinder and into the main sewer or an auxiliary sewer connecting with a main sewer.

Provision is made in the machine to take care of any inorganic material overlooked by the sorters. The material is forced into a trap at the back of the grinder, while water from a spray pipe in this trap passes through the bar grating in the bottom where the material lodges. This inorganic material is occasionally raked out through a hinged door at the back.

The Jeffrey green garbage grinder is made in six sizes from 20 x 12-inch requiring 25 horsepower for operation and running at a speed of 1,500 to 2,000 rpm, and with a capacity of 6 tons of material ½-inch or finer per hour. The largest machine is a 42 x 48-inch unit requiring 200 horsepower for operation, running at a speed of 700 to 1,000 rpm, and capable of handling 60 tons per half-hour.

A New Cold Lay Asphalt Paving Mixture

A cold lay asphalt paving mixture, known as Sealdrok, which has waterproofed mineral aggregate and is produced by an asphalt mixing plant containing many innovations of plant design, has been announced by the American Sealdrok Corporation, 43 East Ohio Street, Chicago, Ill. Inasmuch as approximately 94 per cent of all asphalt paving mixtures is mineral aggregate, this process provides that the aggregate be thoroughly dried and graded as to the proper sizes. It is then impregnated with a waterproofing compound having an asphalt base, leaving each particle of the aggregate sealed with a film of pure bitumen. After this it is treated with asphalt cement of 60-70 penetration.

The asphalt mixing plant is of the continuous mixing type, is entirely automatic, and is set to predetermined capacities from 20 tons an hour to as high as 40 tons an hour. All the materials are accurately measured and controlled to produce a uniform mixture. The plant requires but three laborers for its operation, thus reducing production costs. The drier arrangement for the mineral aggregate both dries and cools the aggregate in one chamber, eliminating any danger of hot aggregate destroying the cementing value of the asphalt. It requires three full minutes for the mixture to pass through the mixer, thereby insuring thorough intermingling and coating of the mineral aggregate with the asphalt cement.

Aggregate may be shipped and stockpiled for future use after impregnating with waterproofing compound, and the asphalt coating may be applied locally using the usual concrete mixer or by penetration. The average city does not have adequate equipment or skilled labor for the proper conditioning of mineral aggregate on the job, and the Sealdrok

The gravity system is "Nature's Way"

A modern municipal water system must not only have an unfailing source of supply, but it must also have a dependable means of delivering the water to its consumers. Pumps should deliver water into an elevated storage tank, which will insure an even pressure and provide the necessary reserve in the event of pump failure.

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Separate Leads — Sealing Wire

Write for samples and prices for your requirements.

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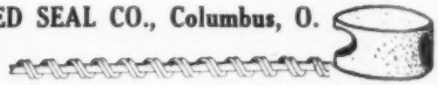

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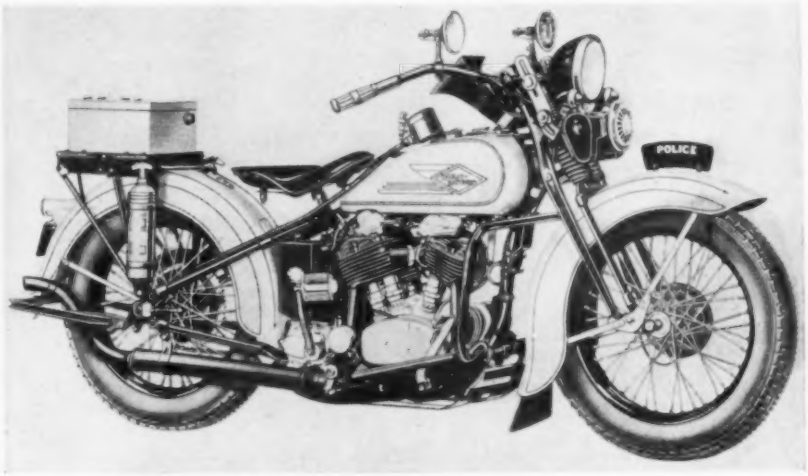
Do You Want Prices on Anything?

Readers of THE AMERICAN CITY desiring to secure catalog or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, 470 Fourth Ave., New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.

mixing plant installed in a quarry or gravel pit makes it possible to supply the city with a waterproofed aggregate.

Waterproof mineral aggregate provides an economical material for building and widening road shoulders, furnishing a dustless and waterproof shoulder and preventing the water from running underneath the concrete slab. The Sealdrok process also includes the treatment of stone dust and screenings, which are now more or less a waste product at quarries. This treated material may be stored in convenient stockpiles for future use and may be utilized for covering macadam roadways and streets in place of oil, for the covering of parking areas to prevent dust, under sidewalks in place of cinders, and many other uses. Sand may be treated and used for the same purposes.



A HARLEY-DAVIDSON 1934 POLICE MOTORCYCLE EQUIPPED WITH A POLICE RADIO RECEIVING SET

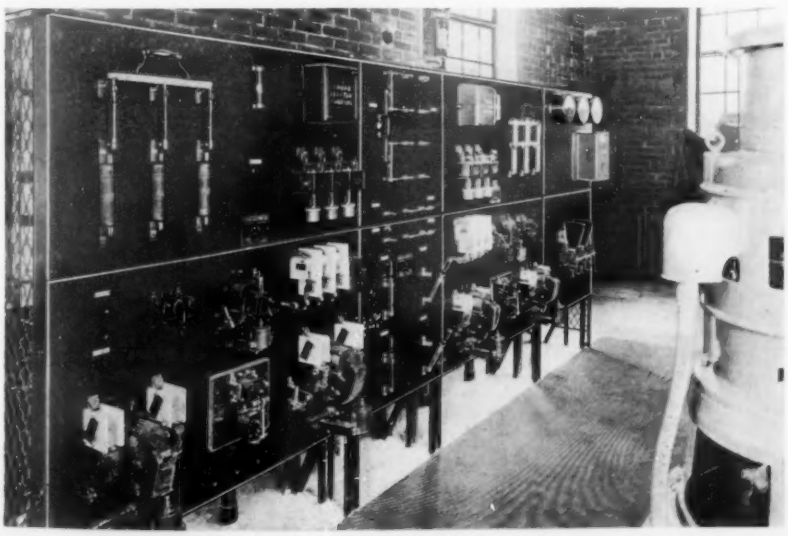
Automatic Sewage Pump Control at Danvers, Mass.

The two sewage pumps in the South Essex Pumping Station, Danvers, Mass., are driven by 550-volt, 3-phase, 60-cycle, slip-ring motors, one 40-hp and the other 30-hp. This station is completely automatic in its operation, and the control is laid out very carefully to give adequate protection against the usual electrical conditions which may be expected from a rural overhead electrical supply. In addition to the various features of electrical protection, special protection for the pumps themselves was worked into the control design.

These pumps handle unscreened sewage which might contain and in fact has contained material large enough to completely block the suction to the pump. If the pumps were allowed to continue in operation under this condition, they would be severely damaged in a short time. By taking advantage of the fact that the horsepower input to the pumps drops off materially when the suction is blocked, underload relays with special timing features were developed which act to disconnect the particular pump from the line if this condition occurs.

Since the head against which the pumps are working includes a large percentage as friction, a study of over-all power consumed per million gallons pumped showed that the over-all efficiency was considerably increased by running the pumps at reduced speeds during those periods when the volume of sewage to be pumped was low, so that the control is designed to operate each pump on three different speeds.

All the control equipment is mounted and wired on the switchboard illustrated, which simplifies operation and maintenance. The Sundh Electric Co., now combined with the Clark Controller Co., of Cleveland, Ohio, designed and furnished the control equipment. Chester L. Nyman is the District Engineer in charge of this and other pumping stations of the South Essex system.



THE CONTROL PANEL OF THE SOUTH ESSEX PUMPING STATION AT DANVERS, MASS.

A Radio-Equipped Police Motorcycle

There is no more exacting service for a police radio than its mounting on a police motorcycle. The ordinary car radio won't do, and the radio must be designed so that the motorcycle will not be top-heavy. The Harley-Davidson Motor Co., Milwaukee, Wis., has produced a police motorcycle radio that is not a made-over car radio, but is designed and built specifically for motorcycle service. It was not rushed haphazardly onto the market to fill a demand, but represents the knowledge gained by over three years of the most intensive research work, experiment and testing. The Harley-Davidson police radio includes one Harley-Davidson police receiver, complete with tubes and shielded cables, a Harley-Davidson police B converter with tubes, a steel radio box with rubber mounts, brackets, clips and bolts, a plate antenna with rubber insulators and brackets, a magnetic unit speaker and brackets, a supersize Harley-Davidson generator, a shielded spark coil with shielded cables, one set of generator by-pass condensers and two spark plug resistors, a set of aluminum spark plug shields and a reinforced luggage carrier.

Scores of Harley-Davidson police motorcyles are equipped with these radios in daily service throughout the country, increasing greatly the effectiveness of the motorcycle officers. Included in the departments using this radio equipment are Des Moines and Davenport, Iowa; Milwaukee City and County, Wis.; Omaha, Nebr.; Dallas, Waco, Beaumont, and El Paso, Texas; Atlanta, Ga.; Birmingham, Ala.; Santa Barbara, Calif.; the Arizona Highway Patrol and the Washington State Highway Patrol.

Association Moves to Larger Quarters

Calcium Chloride Association has moved to larger quarters at 2075 Penobscot Building, Detroit, Mich. This move was necessitated by expanding activities and staff increases.

INSIST ON GOOD STREET-LIGHTING GLASSWARE

THE satisfaction that your street-lighting installation gives depends to a great extent on the type of glassware you use. It must have a pleasing appearance, both day and night. It should have a surface designed to give sparkling light. It must be of the correct density to diffuse the light adequately. It must be tough and strong, and it must be easy to clean.

When you insist upon Gleason-Tiebout glassware, you assure yourself all of these important advantages. The careful annealing process to which it is subjected strengthens the globe against breakage from any sudden temperature change and against ordinary shock resulting from careless handling. The rippled surface provides diffusion and sparkling appearance, and makes it easy to keep the globe clean.

Scientifically designed glassware is essential to correct illumination. It will help to provide greater protection for your city and, consequently, give a high return on the investment by decreasing accidents and crime.

Gleason-Tiebout makes glassware to meet the exacting specifications of General Electric engineers. These engineers will be glad to assist you in planning installations that will meet every requirement.

General Electric Form 25C Novalux street lighting unit with Gleason-Tiebout No. 193 rippled outer globe

(At top of page) Operators placing globes in annealing oven

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PROPER
STREET LIGHTING
PROMOTES SAFETY,
DISCOURAGES CRIME,
AND BOOSTS BUSINESS

GT-27

GLEASON-TIEBOUT GLASS COMPANY

99 COMMERCIAL STREET, BROOKLYN, N. Y.

During February we hope you will remember to mention THE AMERICAN CITY

NEW CUSTOM-BUILT LINE TRUCK BODY OF THE VILLAGE OF FRANKFORT, N. Y.

Truck Bodies for Municipal Electric Light Departments

The accompanying illustration shows a new custom-built line truck body built on a standard 1½-ton Ford truck with a platform body, for the village of Frankfort, N. Y., by the Mohawk Asphalt Heater Co., of Frankfort. Steel uprights form a framework for the various compartments above and below the truck platform, for storing small supplies and tools. The rack above provides space for pike poles, spoons, etc., and the top rail is provided with hooks for hanging tackle, coiled wire, and cable. Ladder hooks are provided on both sides. The various compartments are built of heavy gage steel with partitions and trays inside. The doors are also of steel, reinforced and hinged at the bottom, with a unique combination catch and hasp. Top bows are provided to support a waterproof tarpaulin in bad weather, and these can be grouped at the front end when the tarpaulin is not in use.

The Mohawk Asphalt Heater Co. is prepared to design, and equipped to build, any type of steel body desired. It manufactures a complete line of trailer tool boxes for gas and electric use as well as pipe and pole trailers, splicers, carts, lead melting pots in addition to its line of asphalt heaters, tool heaters, etc., for the street and highway department.

A New Lighter Crankless Diesel Engine

A crankless diesel engine, built horizontally and of unprecedented light weight and small size, has been announced by the Sterling Engine Co., 1252 Niagara Street, Buffalo, N. Y. The revolutionary compact construction of the engine, which is obtained in part through the absence of crankshafts, camshafts, cylinder heads, valves and cylinder head gaskets, makes the power plant adaptable for many mobile and stationary uses. The engine is of two-cycle design, and will run on the lowest grade of fuel oil, cheaper than that with which many may heat their homes.

Sterling engineers estimate a 75 per cent fuel cost saving in the new power plant over the ordinary gasoline engine. The over-all dimensions of the Sterling diesel are comparable in size to a gasoline engine developing the same horsepower, with the added advantage of a much lower height. The weight per horsepower of the new diesel ranges from 13 to 20 pounds, dependent upon the size of the power unit as against the 50 to 80 pounds per horsepower in the conventional diesel.

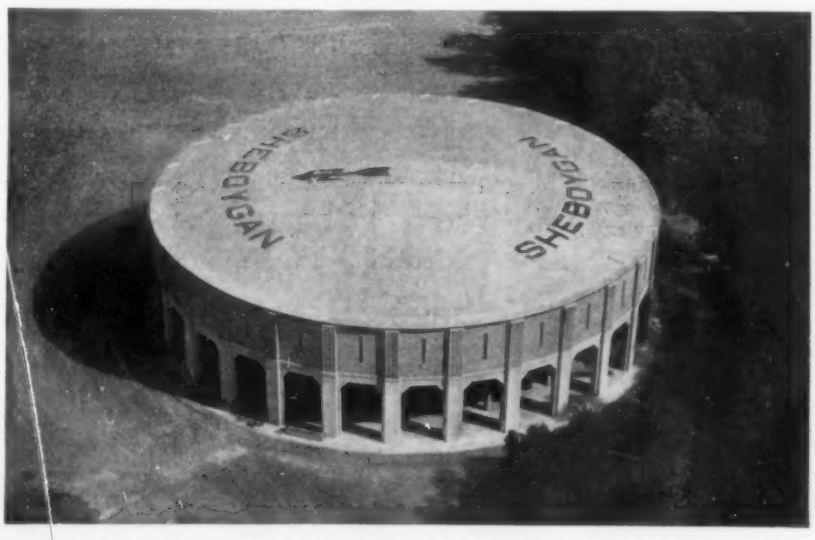
The engine includes either 4 or 6 horizontal cylinders, each containing two opposed or reciprocating pistons, equivalent to a power plant of the eight- or twelve-cylinder type by virtue of the Sterling 2-cycle design. Combustion is obtained by compressing the air between the heads of each pair of opposed pistons, and at the point of maximum pressure an injection of fuel is made and ignited by the heat of compression. The power generated by the pistons is transferred to inclined discs, which are virtually flywheels, mounted on a straight drive shaft at each end of the engine. The mechanical bearing units, which transfer the power from the reciprocating pistons to the rotating discs, involve exactly the same principle as that employed in the Michell or Kingsbury thrust bearings, used in most of the world's ships. These bearings, which have a universal mounting, are free to adapt themselves to the action of the inclined disc.

In the engine's cycle or operation, intake and exhaust occur almost simultaneously following the explosion in one revolution, as compared with two revolutions required in a 4-cycle engine. The power of the diesel engines is limited by their breathing capacity, but in this Sterling crankless type, the intake and exhaust port areas are several times that of the restricted area possible with a 4-cycle engine. Additionally, the air for combustion is supplied by a charging pump.

A piston type scavenging air blower is used, because pressure scavenging is necessary in 2-cycle diesel engines, and a piston type, valveless blower is particularly applicable to the design of the engine, without the use of additional or complicated operating mechanism. This Sterling blower has no poppet or automatic valves, nor connecting rods, nor crankshaft. Cylinder heads are automatically eliminated in this opposed-piston engine.

Pirnie Resigns as NRA Deputy Administrator

Malcolm Pirnie, consulting engineer, 25 West 43rd Street, New York, resigned as Deputy Administrator of the NRA on January 10, and the resignation was accepted by General Hugh S. Johnson, Administrator of the NRA on January 11, 1934. As Deputy Administrator Mr. Pirnie was engaged in the codification of the Construction Industry. He has returned to New York to resume his engineering practice.



Courtesy of Chicago Bridge & Iron Works, Chicago, Ill.

AERIAL VIEW OF THE COMPLETED 4,000,000 STEEL STORAGE RESERVOIR ON TAYLOR HILL, SHEBOYGAN, WIS.

Note the air navigation markings on the roof. See article on page 39-40, THE AMERICAN CITY, September, 1933, for complete description of this largest municipal tank.

Holophane

With Holophane You Pay Only for **Useful** Light

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Holophane Asymmetric Refractors shape the light to the street—to the character of the roadway—to the demands of traffic. They are most efficient because they provide illumination *only* where needed; most economical because you pay only for *useful* light. Holophane Co., Inc., 342 Madison Ave., New York, Canadian Office, Toronto. Works, Newark, O.

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HOLOPHANE
REFRACTORS FOR STREET AND HIGHWAY LIGHTING

FENCE *for every* PUBLIC PROPERTY *need*

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IRON AND CHAINLINK WIRE
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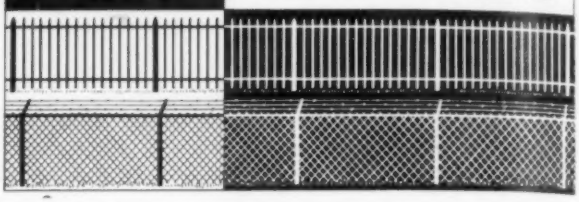
The Stewart Iron Works Company, Inc.
211 Stewart Block Cincinnati, Ohio



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Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Correct, Economical Design and Maintenance of Street-Lighting Systems

THE modern, ornamental street-lighting systems that may be found today in many municipalities in the United States, and more or less throughout the world, are positive evidence that municipal governing officials have recognized the importance and necessity of correct planning and designing of street-lighting systems. The fact that the Illuminating Engineering Society, a national engineering organization, made its Committee on Street Lighting one of its important standing committees, is further proof that the art of street lighting is essentially an engineering practice. The membership of this committee is composed of illuminating engineers, representing manufacturers of street-lighting equipment, utility companies, engineering colleges, and municipalities. As a result of research and studies, during the last few years particularly, this committee has prepared, among other contributions, a Code of Street Lighting which is an engineering treatise on this subject.

Adequate Street Lighting

The Code states that "the lighting for a street should be designed with due regard to the type of the street and its traffic, to the characteristics of the street surface, to the type of buildings along the street, and to the presence or absence of trees. It should be made adequate to permit local authorities to require that powerful automobile headlights be depressed or dimmed. For a proper understanding of lighting requirements, the characteristic mode of seeing in the streets at night should be considered. Lighting units should be located at optimum heights and transverse positions, and should be spaced properly. Lamps should be equipped with accessories of types best suited to apply the available light to the maximum accomplishment of the purposes stated. Glare should be minimized. The appearance of the street-lighting equipment and of the street as affected by the lighting equipment should meet esthetic requirements. Finally, economy of installation and operation should be sought."

It is essential that these fundamentals be carried out in all street-lighting installations if the systems are to be correctly designed and to properly function.

Owing to the stress in municipal finances and the public demand that the greatest possible economies in government be accomplished, municipal governing boards during the past two years have in many cities curtailed street lighting, along with reducing other municipal services. In some of these cities—Detroit affording the most striking example—curtailing street lighting has produced increased crime and traffic accidents. Detroit has been able to show by statistics that it is more economical to maintain good street lighting than to pay the increased losses resulting from the increase in crime and traffic accidents due to the curtailing of street lighting.*

In most municipalities where street lighting has been curtailed, the economic results have not been so obvious as in Detroit. This is undoubtedly due to the absence of sufficient statistical information. Unquestionably, when proper data have been collected, it will be found that crime and traffic accidents have increased with the reduction of street-lighting service.

Outdoor Lighting a Protection

Richard E. Simpson, Safety Engineer for the Travelers Insurance Company, of Hartford, Conn., has conducted a thorough investigation† of the night street accident records for 42 cities in the United States, covering the years 1931 and 1932, for which adequate statistics were available. Of these cities, 22 increased their street-lighting budget expenditures in 1932 over those of 1931, by an average of 11 per cent. This increase in expenditure was paralleled by a striking reduction of 25.1 per cent in the number of night-time fatalities. The per capita increase in the street-lighting cost of these cities was 9 cents. The economic saving represented by the decrease in automobile night accidents, however, was equal to a saving of $2.07 per capita.

It is probably true that the particular individuals who benefited by not having the accidents they would have had under inadequate street lighting are only a part of the individuals who paid for the improved lighting; but since so large a percentage of our citizens are automobile owners, the expense of providing adequate street lighting of all of our cities would result in an economic saving for substantially the same individuals as those who financed the better street lighting. Indeed, since the economic saving is 23 times the increase of per capita street-lighting costs in the above-mentioned cities, it can fairly be said that, through avoided street accidents, substantially every taxpayer would, over a term of years, receive a saving materially greater than the street-lighting costs.

Twenty cities of the 42 investigated decreased their street-lighting budgets. The decreased expenditure amounted to 19

Illuminating Engineering Is an Essential Division of Municipal Administration

* See THE AMERICAN CITY, February, 1933, page 93; April, 1933, page 91.

† "The Life-Preserving Role of Good Street Lighting."

cents per capita, but the per capita cost of the increased night accidents was 69 cents. This comprehensive investigation has established beyond question that the public interest is ill served by the mistaken economy of reducing street-lighting expenditures. With a return to normalcy in municipal financial conditions, this fact should be a compelling force in the public demand for the rehabilitation of our street-lighting systems.

Blind Slashes

Unfortunately, it seems that, in general, the policy of reducing street lighting was not based on competent surveys to determine how much reduction could be made without seriously affecting the community. Usually a definite budget cut was arbitrarily fixed by the municipal governing board, and the service had to be reduced accordingly. This practice did not permit any competent engineering survey to determine how much the service could be curtailed without increasing traffic hazards and gravely affecting general public safety. That this was a serious mistake has been proved by national surveys, such as the one recently made by Mr. Simpson.

Economy in municipal governmental expenditures is not only always desirable, but undoubtedly will be especially necessary for some years to come. In line with this thought, too much emphasis cannot be given to the desirability of rehabilitating our present curtailed street-lighting systems according to the principles and the practices of illumination, in order to obtain from the system the maximum of service at the minimum of cost. It is not only uneconomical but unjustifiable for municipal governing boards to permit their street-lighting systems to be built up or maintained in a haphazard manner and without engineering advice. It would be just as logical to build our water and sewer systems and pave our streets without the advice and services of competent and properly trained engineers.

Funds to meet municipal street-lighting expenditures are usually appropriated from tax receipts, in the same way that other municipal appropriations are made. It is therefore equally essential that these funds be expended wisely. If the street-lighting system is not correctly designed and efficiently maintained, a proportionate waste of funds results, and the system is not giving proper service to the community.

EDITORIAL NOTE: The foregoing article has been prepared from the recent report of the Committee on Street and Traffic Lighting of the American Society of Municipal Engineers; Ellsworth Francisco, Engineer in Charge of the Bureau of Lighting, Newark, N. J., is Chairman.

Lighting Installation on Carlton Boulevard, Jackson, Michigan

Courtesy of Westinghouse Electric & Manufacturing Company

THIS INSTALLATION CONSISTS OF SHERIDAN 13-FOOT GRANITE STANDARDS WITH EDGEWATER DUPLEX TOP SECTIONS AND WASHINGTON LUMINAIRES

The height to light center is 17 feet. The standards are spaced 109 feet apart and 6,000-lumen lamps are used

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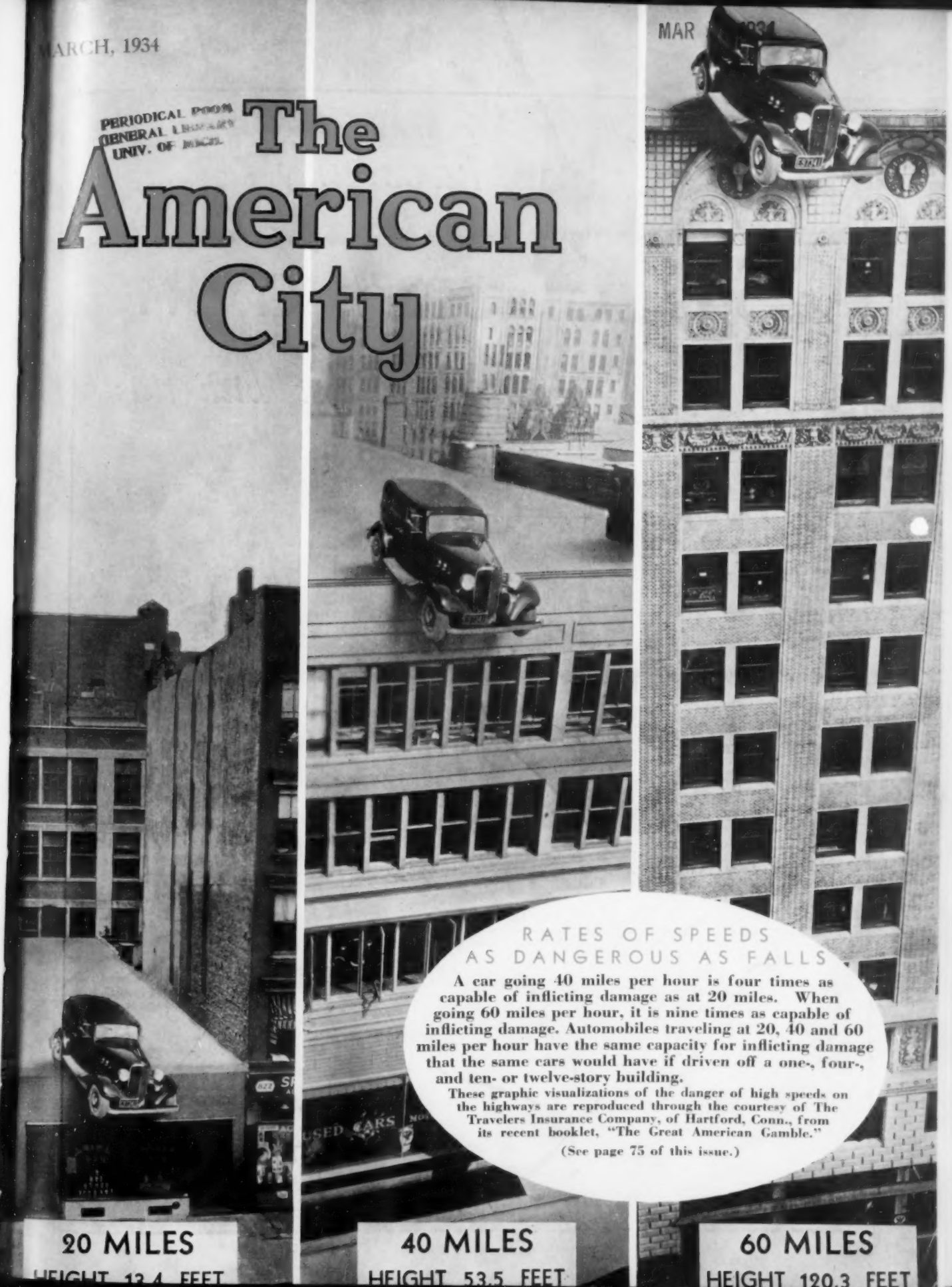
The American City



RATES OF SPEEDS AS DANGEROUS AS FALLS

A car going 40 miles per hour is four times as capable of inflicting damage as at 20 miles. When going 60 miles per hour, it is nine times as capable of inflicting damage. Automobiles traveling at 20, 40 and 60 miles per hour have the same capacity for inflicting damage that the same cars would have if driven off a one-, four-, and ten- or twelve-story building.

These graphic visualizations of the danger of high speeds on the highways are reproduced through the courtesy of The Travelers Insurance Company, of Hartford, Conn., from its recent booklet, "The Great American Gamble."

(See page 75 of this issue.)

20 MILES
HEIGHT 13.4 FEET

40 MILES
HEIGHT 53.5 FEET

60 MILES
HEIGHT 120.3 FEET